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The Jubilee Review

ALL the Royal Air Force feels honoured that the King has inspected it on the ground and taken its aerial salute. It was an honour to the Force that the King has worn its uniform, and was attended by his two eldest sons, also wearing its uniform. It was an additional honour that the King devoted to the review the forty-second anniversary of his wedding, a day which would normally be devoted to family affairs, and everyone must feel glad that the Queen also came to Duxford to witness the fly-past, and that the Royal couple were together for part of that memorable day. If we may say so without presumption, we would add that the R.A.F. uniform, of service pattern worn with slacks and ribbons, became His Majesty very well, and we may hope that he will wear it again.

It must have been no easy task for the Air Staff to decide exactly what form this first Royal review of the Force should take. In the main the units which took part belonged to Air Defence of Great Britain, though the Inland Area was represented by two army co-operation squadrons, and the Coastal Area by the Coast Defence Development Unit. The Fleet Air Arm will have a notable share in the Naval Review. A.D.G.B. provided a selection of regulars, Cadre squadrons partly manned by Special Reserve personnel, and Auxiliary Air Force Squadrons. In fact, all the eight A.A.F. squadrons were present at Mildenhall, and this branch of A.D.G.B. was the only one to be represented *in toto*.

Naturally, the review had to be divided into two parts, an inspection on the ground of as many squadrons as could conveniently be mobilised, and a fly-past by a selected number of squadrons. This made it desirable to use two aerodromes, for the latter part looked better when the squadrons flew past over a clear aerodrome with no machines on the ground. Up to that point the review arranged itself and the next point was to decide whether to make the fly-past spectacular in an aerobatic sense, showing off something of what aeroplanes are capable, or to aim at simplicity and mass. Hendon is the proper place and occasion for aerobatics, and it was decided that the keynote of the fly-past should be organised simplicity. Twenty squadrons were chosen to fly past, and they first flew past in five groups. Then three squadrons fell out, and while No. 19 (Fighter) Squadron gave a restrained exhibition of air drill, perfectly carried out, but not attempting in any way to display the remarkable qualities of the "Gauntlet," the rest were reorganised into six wings and flew past again in this new formation. There was nothing of the Hendon Display spirit about the fly-past, but the perfection of the organisation, and the good formation kept by the squadrons in spite of very bumpy weather conditions, were in themselves extremely imposing.

What did not show itself to the ordinary spectator on the day was the elaborate organisation which produced this simple but perfect result. The staff work of the Royal Air Force had been put to a most searching test, and it emerged triumphant Probably the most intriguing spectacle of the whole day was the take-off of the twenty flying squadrons from Mildenhall after the King had left for Duxford. In the first place, certain squadrons which were not flying had to be moved out

The King's Message

AFTER his review of the Royal Air Force the King sent the following message to Sir Philip Cunliffe-Lister, Secretary of State for Air:

"I warmly congratulate all ranks of the Royal Air Force on the magnificent display which I have had the pleasure of seeing to-day

"I was greatly impressed both by their smartness on the ground and their efficiency in the air, which leave no doubt that they will prove fully equal to any task which they may be called upon to fulfil.

"Please express to all ranks my appreciation of their labours in making the review such an unqualified success, together with my best wishes for the future welfare of the Royal Air Force.—GEORGE R.I."

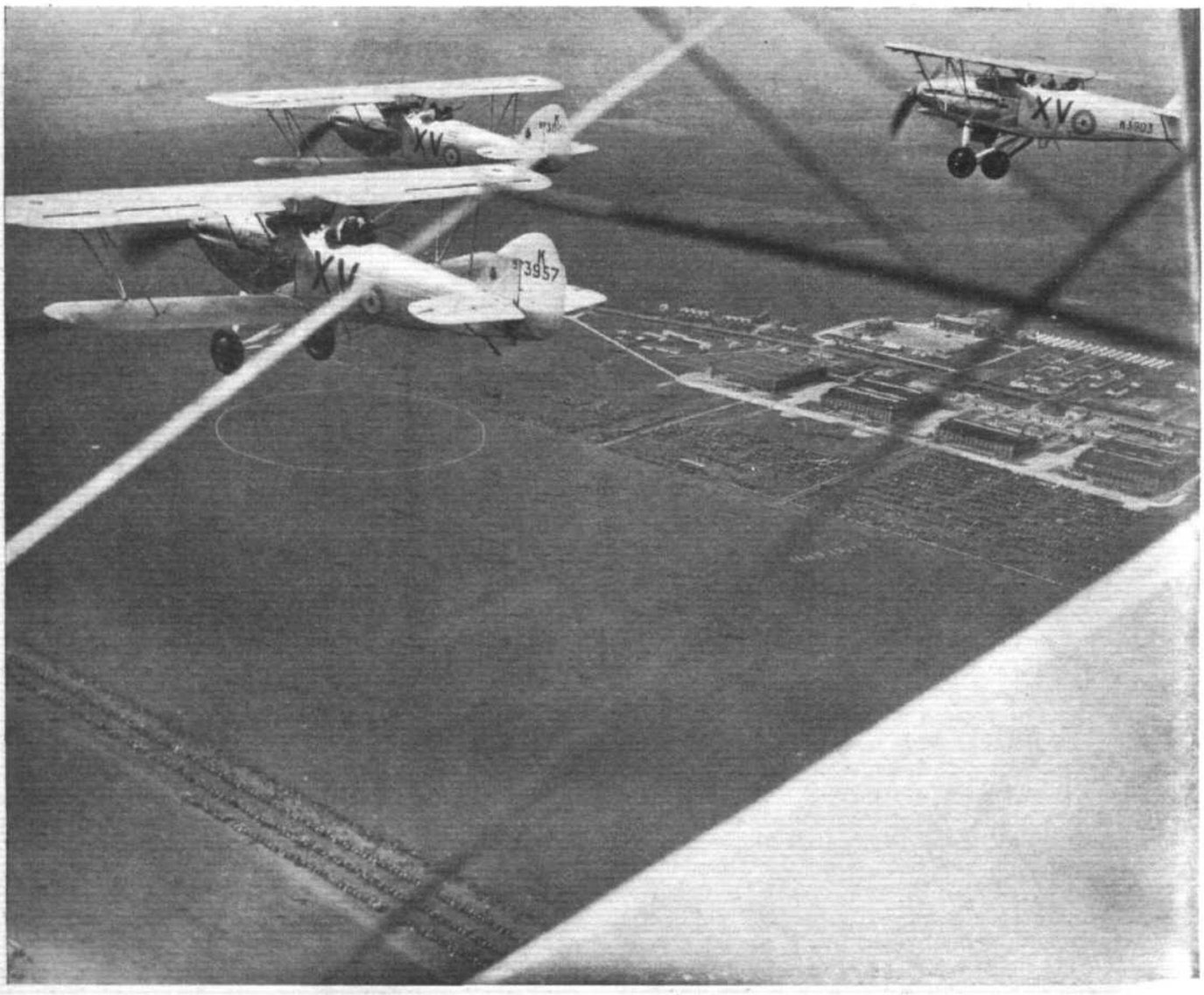
of the way to make lanes for the twenty chosen ones to get clear, and to make sufficient space on the aerodrome for a take-off. The staff had felt many anxieties as to the direction of the wind on the day, but the Clerk of the Weather was as kind in this matter as he had been in providing real King's weather for His Majesty. The heavy bombers took off singly, the light bombers by flights, and the fighters by squadrons. Then the five groups formed up in the air, and each betook itself to an allotted patch of country to mark time until the hour came to make for Duxford. They all had to approach from different directions and at different speeds, with four miles between each group. It called for the nicest synchronisation, and everything worked as perfectly as if the whole affair was the most straightforward piece of work.

The Ground Organisation

Quite a long story could be told about the ground organisation, when Mildenhall had to accommodate 356 visiting aircraft and some 5,000 officers and men. Throughout the week squadrons had to be moved constantly about on the aerodrome like pawns on a chess board.

Incidentally, despite the long hours which had to be spent in the air during the rehearsals, there was only one forced landing, through the breaking of a camshaft drive. This speaks volumes for the reliability of British engines. There were no other mishaps of any kind.

The various staffs of the Royal Air Force have demonstrated in the most emphatic manner that they are masters of the art of organisation, and at this time of rapid expansion of the Force it is extremely comforting to know that most capable hands are at the helm. While at Mildenhall and Duxford it was seen how the problems of mass and of motion, and of speedy, unhasting change from one to the other, were grappled with and solved, at the same time, other branches were working with equal diligence to open five new Flying Training Schools and to rearrange other aerodromes and squadrons to prepare for the trebling of the Air Force. That is an even greater task than the review. It is small wonder that the King in his message to the Secretary of State for Air should say of the Royal Air Force that their smartness on the ground and their efficiency in the air leave no doubt that they will prove fully equal to any task which they may be called upon to fulfil.



SALUTE. A unique photograph taken from a "Hart" of No. 15 (Bomber) Squadron during the fly-past at Duxford last Saturday. The Royal dais is the light structure in front of the central car park.

The Outlook

A Running Commentary on Air Topics

Weather Research

SINCE the transport pilot of to-day must, in the course of his work, encounter and, if possible, push through every conceivable kind of weather, one might imagine that the Air Ministry would make good use of his experience. Apart from one case, where two of the pilots were once in the meteorological flight at Duxford, nobody in the commercial world appears to be actively encouraged to assist the Air Ministry.

One can hardly expect the Government to pay people to help themselves indirectly, but "encouragement" might take the form of the loan of special instruments and the appearance of a real interest in the experiences of transport pilots.

As the R.A.F. originally developed the present system of blind flying training, and as the Meteorological Office carries out its own experiments, there is a tendency among certain of the mighty to consider the civil pilot as an undisciplined amateur. Yet he has every chance of learning more about bad weather flying than the whole Service put together. How many times has one heard of cases where, in really bad weather, the belittled civil pilot got through while a squadron scattered itself over England, or even Europe, in a series of successful or unsuccessful forced landings?

Probably we are being a little unfair in a good cause, but the problem is worth a moment's thought, and the suggestion is surely worth consideration.

Practice Makes Perfect

WHILE on the subject of bad weather, it is still worth reminding transport pilots that the mere ability to pass the "B" licence blind flying test does not necessarily make a safe blind-flying pilot. Probably fifty amateurs in various parts of the country have taken instrument flying courses and are quite capable of holding a compass course through a cloudbank, yet very few of them would be capable of dealing with the mass of problems and calculations confronting the air line pilot in Q.B.I. conditions.

The air line pilot must be able to fly by instrument almost without conscious effort, and certainly with absolute confidence. While he is flying he may be using his wireless or being handed a constant stream of bearing slips by his radio operator—if he has one.

During the past few years a number of accidents in bad weather have occurred to machines flown by pilots who were probably not too happy or comfortable during instrument flying. Two, at least, were caused by the fact that the pilot came down through cloud or fog to "have a look at the ground"—a fatal thing when the ground, even on the Paris run, reaches up eight hundred feet or so.

The obvious thing to do is to practice whenever possible. In other words, to go into cloud and to stay in it, asking for bearings and flying on them. One might cite the unauthenticated case of the Deutsche Luft Hansa pilot, who, when everyone at Le Bourget was hoping to be able to stay on the ground, made three apparently abortive attempts to come in on D/F bearings. After he had landed he spoke to the control officer: "Good morning. I have a new radio operator. Good practice for him; good practice for me; good practice for you. Good morning." True or not, it is a good story—with a moral for all transport pilots.

Multiple Guns

THE order placed by the Air Ministry for a number of Browning machine guns of American origin, and capable, it is believed, of firing about 1,200 rounds a minute, gives food for thought on the future of the armament for fighters.

There seems to be little doubt that the day of the ordinary "two-gun" single-seater fighter is nearly over; that is, if the weapons concerned are of the normal rifle calibre variety. In its place is appearing the single-seater with four or six of these weapons, or possibly with one or two small-bore *canons* (as the French call the shell-firing guns they are mounting in their latest single-seaters) in addition to machine guns.

Some indication of the way the wind is blowing on the Continent may be gathered from the fact that the Lithuanian Government has adopted a French high-wing fighter with six pneumatically controlled wing guns; the new standard French fleet fighter has four guns, with a pair of *canons* as optional equipment, and the Fairey "Fantome"—a British product entered for a Belgian competition—has a 20 mm. *canon*, firing through its geared airscrew shaft, and four wing guns. These latter, incidentally, are Brownings.

A few years ago we had in this country a six-gun fighter, and the latest single-seater accepted for service has four. Just what the Air Ministry thinks of the small-bore *canon* we are not at liberty to say, but it is known that a 37 mm. quick-firer has for some time past been installed in a single-seater produced for the intercepter competition six or seven years back. It certainly seems that, after long deliberation, it has been decided that a number of high-speed, small-calibre guns is preferable to fewer but heavier weapons.

We may look forward to some interesting developments in the arming of British fighters in the near future.

In Mid-ocean

DURING the past few years it has been customary for most people to suggest that the land machine, with a multiplication of engines, would be as suitable as a flying boat on long sea crossings—particularly since the land machine carries, generally speaking, a better payload than the flying boat.

Last week the flying boat was amply justified, and the advantages of reliable radio communication were again proved, when a Deutsche Luft Hansa boat suffered engine trouble over the South Atlantic. In the commercial aviation section the details of this decidedly "romantic affair" are given. Both the supply ships steamed towards the known position of the Dornier "Wal," and the *Graf Zeppelin*, on its weekly crossing, stood by until all was well.

Undoubtedly the Atlantic must have been moderately calm, but a land machine, even if successfully put down on the sea, could not possibly have survived for seventeen hours, and without D/F wireless neither the airship nor the supply ship could have found the disabled flying boat. Incidentally, this machine, which is usually loaded to the limit with fuel and mail—at least at the start of the crossing—managed to carry on for five hours on one engine. That is certainly good going, but all machines used for such work should be capable of flying on full load with one engine out of action. Year by year we learn that machines which are theoretically capable of continuing flight under such circumstances manage, in practice, to fail in the test with very much lighter loads.

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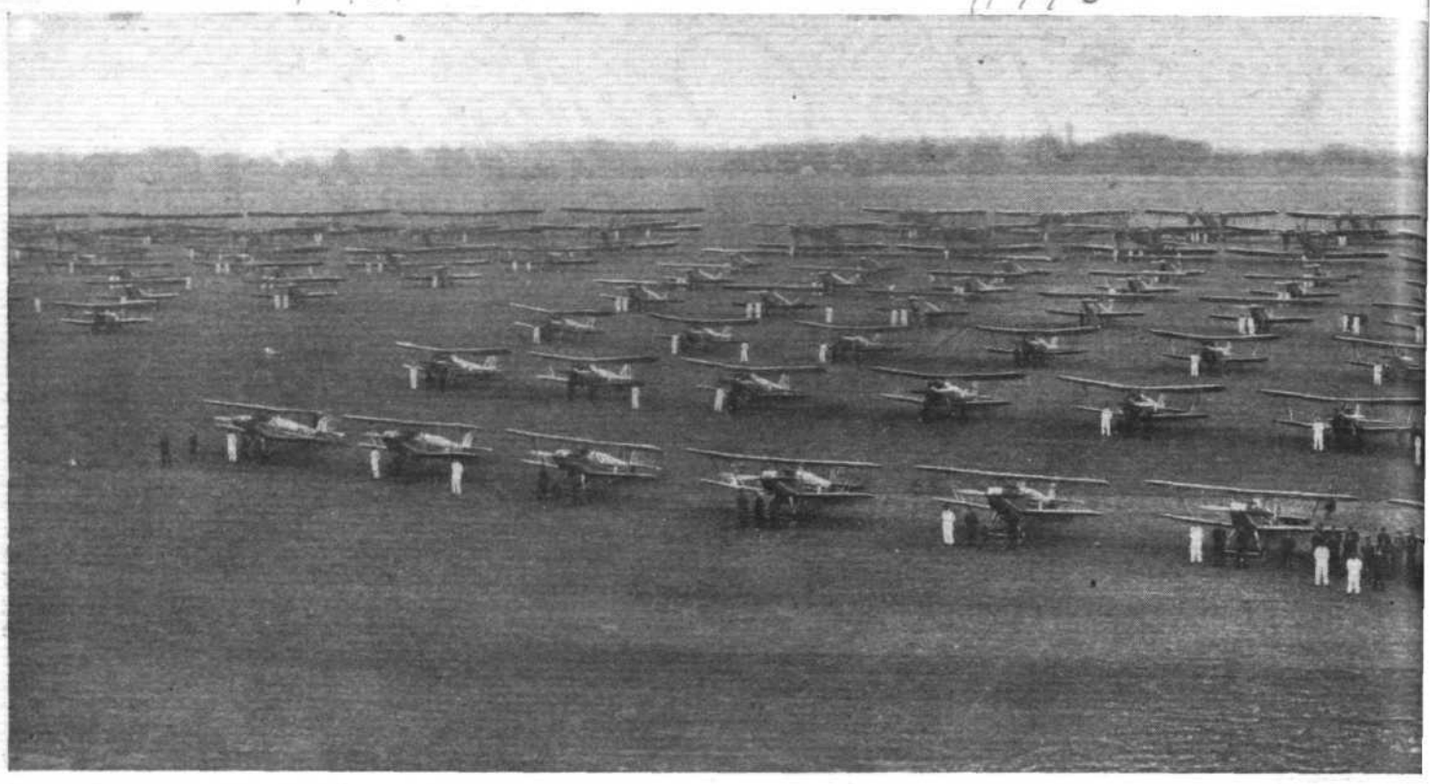

THE KING REVIEWS the ROYAL AIR FORCE

An Impressive and Dignified Spectacle : The Story of the Events at Mildenhall and Duxford, and of the Magnificent Organisation that Lay Behind them.

JUBILEE year is being marked by reviews of the three fighting services by His Majesty the King in person, and for the youngest of the three this was the first Royal review ever held. The date fixed was last Saturday, July 6, and the programme was drawn up in two parts, first a ground review at Mildenhall and in the afternoon a fly-past at Duxford. The King is the Chief of the Royal Air Force, and though he has never had himself gazetted in that Force—he is Admiral of the Fleet and Field Marshal—it was announced that he would, for the first time, wear the uniform of Marshal of the Royal Air Force.

On Monday, July 1, the chosen squadrons assembled at Mildenhall, and all the week was spent in practising and rehearsing. On the Tuesday and the Thursday full rehearsals were held, and the intermediate days were very full ones for all the staff officers concerned. No fewer than thirty-seven squadrons and one other composite unit assembled, comprising 356 aircraft, while a large camp of tents was pitched to accommodate some 5,000 officers and men. All the latest devices, such as Zwicky refuellers, were mobilised, and nothing was spared which could make everything run smoothly. The squadrons which were chosen for the ground review were :—

Regular squadrons: Nos. 1, 3, 17, 19, 23, 25, 32, 43, 54, 56, 111 (fighter) squadrons; Nos. 12, 15, 18, 35, 57, 142 light bomber squadrons; No. 101 medium bomber squadron; Nos. 7, 9, 10, 58, 99 heavy bomber squadrons; Nos. 2, 26 (army co-operation) squadrons; and the Coast Defence Development Unit from Gosport.

Special Reserve squadrons: Nos. 501, 504 light bomber squadrons; Nos. 500, 503 heavy bomber squadrons.

Auxiliary Air Force squadrons: Nos. 600, 601, 604 (fighter) squadrons; Nos 602, 603, 605, 607, 608 light bomber squadrons.

It was decided to draw these units up in four blocks arranged in a semi-circle in front of the Royal Standard, each block with the frontage of one squadron. The block farthest to the left of the whole line was seven ranks in depth, and the other three were each eight ranks deep. The three "Fury" squadrons and the one "Gauntlet" squadron were in the first line, and No. 43 F.S. on the right was the first squadron to be inspected. In the right-hand block behind No. 19 F.S. were the A.A.F. and Special Reserve squadrons and the Coast Defence Development Unit, while in the other blocks the fighters were in the foremost lines with the light bombers and army squadrons behind them, and the heavy bombers ("Heyfords," "Virginias," "Hinaidis") and medium bombers ("Overstrands") in the two rear ranks.

Mildenhall is a big aerodrome, but, even so, it took a lot of manœuvring to get all these squadrons into position, and the ground manœuvres were practised over and over again, until every squadron leader and every fitter knew exactly what he had to do. The effect of the mass formation was impressive in the extreme. The weather was kind, though the wind was sometimes high, and one night the mobile searchlights on the aerodrome were turned on to the assembled machines, making a striking picture (see p. 45). At the same time, the problems of disentangling the twenty squadrons which were to fly past at Duxford, and of making a take-off run for them in any direction of the wind, gave the staff

The panorama at the top of the page shows one of the four blocks of squadrons lined up in review order at Mildenhall. (*Flight* photograph.)

On the right-hand page the King is seen alighting from his car at Mildenhall while the guard of honour presents arms.

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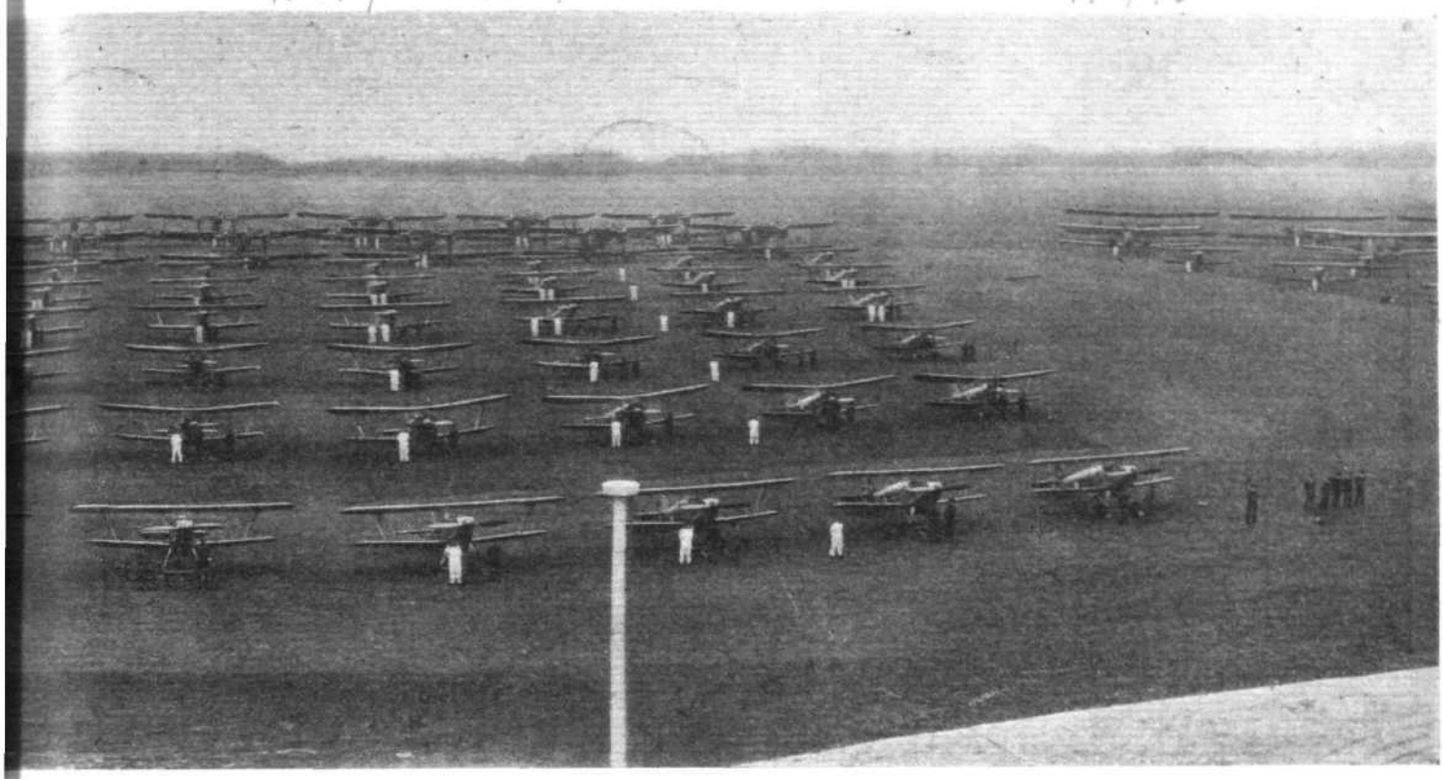

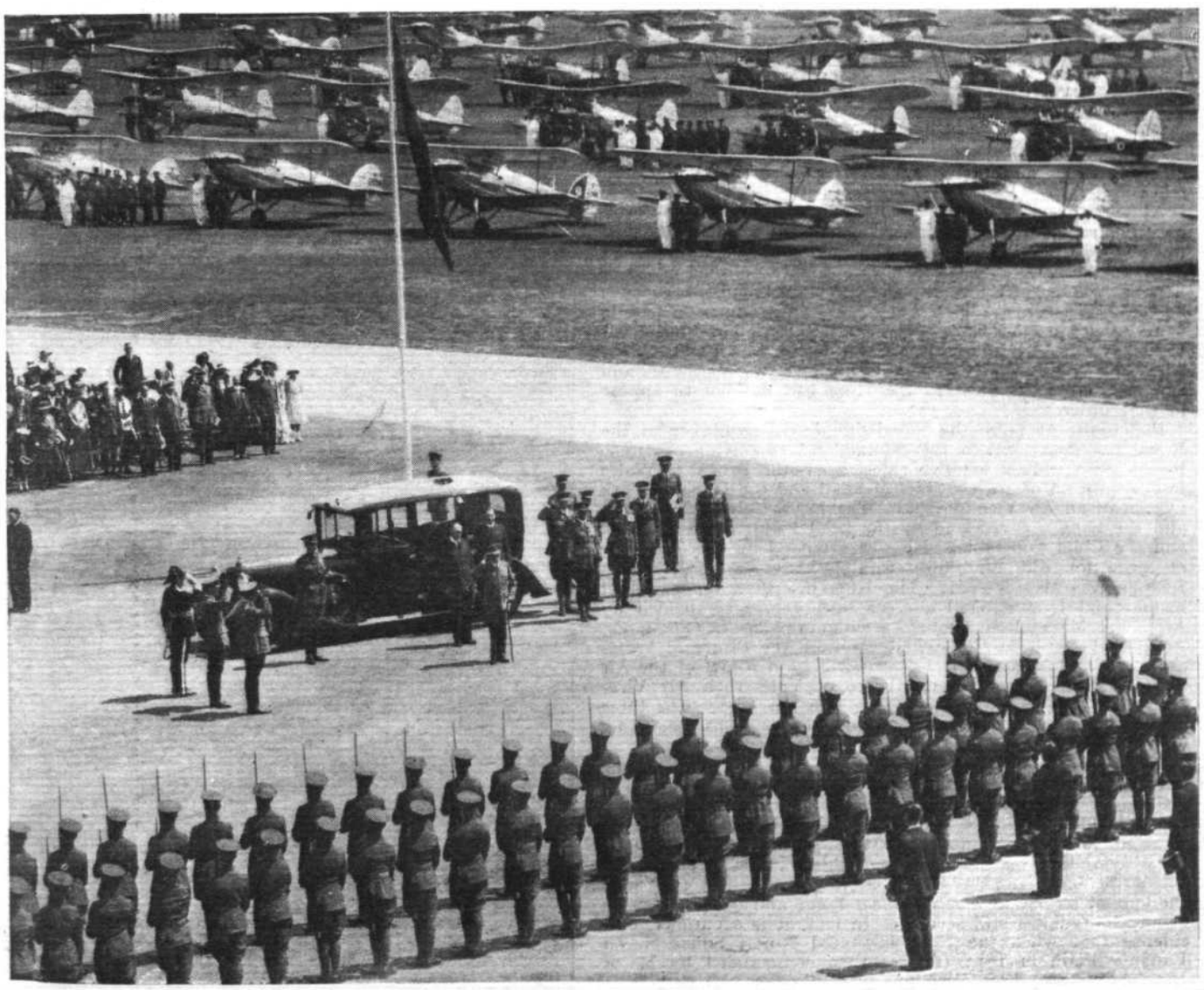

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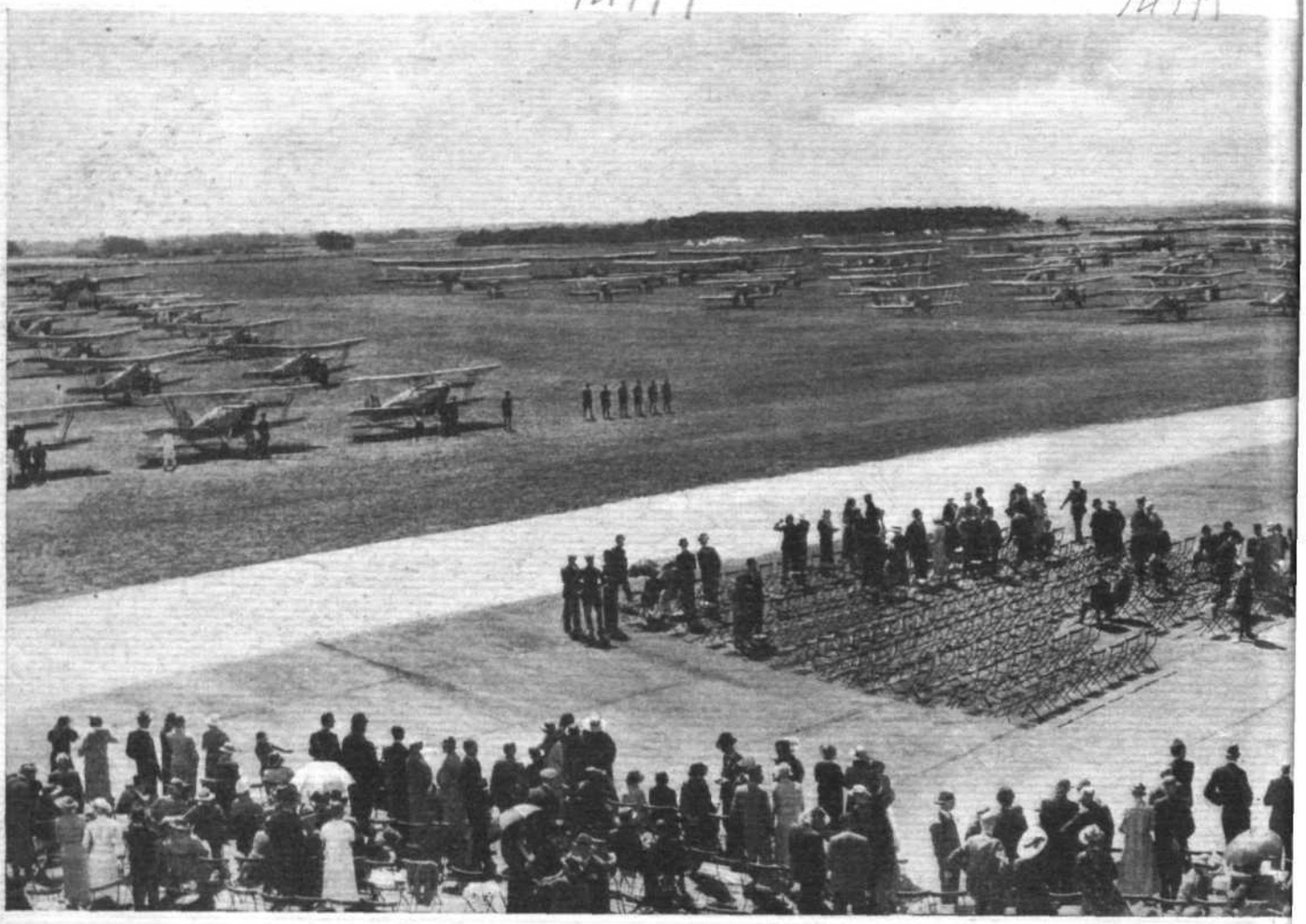

Above is a general view of the scene at Mildenhall as the King, the Prince of Wales, and the Duke of York drove slowly along the serried lines of massed squadrons. Below is an aerial view taken from a "Demon" of No. 23 (Fighter) Squadron in the third phase of the fly-past at Duxford. On each side can be seen a flight of Hawker "Demons," and below the flight on the left is No. 12 (Bomber) Squadron, while below the flight on the right can be seen No. 142 (Bomber) Squadron. (*Flight* photographs.)

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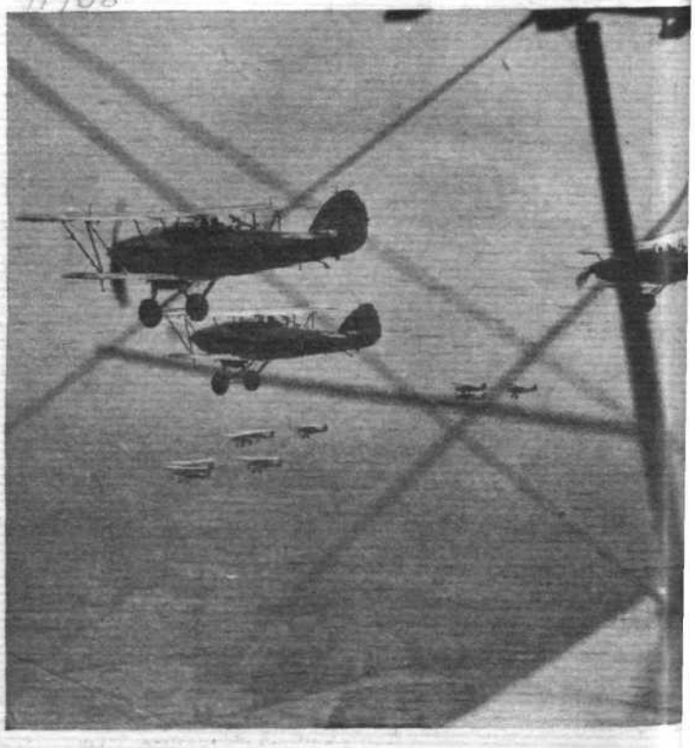

much thought, and this manœuvre was also thoroughly well rehearsed.

At last the great day arrived, and the sun shone cheerily on airmen and aircraft, with just enough of a zephyr to keep the temperature pleasant. The Cranwell station band marched on to the aerodrome, followed by the highly polished guard of honour, whose three officers were in complete full dress, with busbies and swords. The other officers and airmen on parade wore service dress with medals, but the members of the Air Council, Marshals of the Royal Air Force, the Chief of the Air Staff, and the Commander-in-Chief wore slacks and ribbons, but no medals, as the King had decided to appear in that order.

Punctually at 11.20 the Royal Standard was broken as the Royal car drove on to the ground, and the King alighted. Behind him walked his two eldest sons, the Prince of Wales in the uniform of an Air Chief Marshal and the Duke of York in that of an Air Vice Marshal. The Royal Salute was given, and the King was received by the Lord Lieutenant of Suffolk and the Chief Constable. He was attended by the Secretary of State for Air, Sir Philip Cunliffe-Lister, and Sir Philip Sassoon was also present. The King inspected the guard of honour and then entered a green open car, accompanied by Air Chief Marshal Sir Robert Brooke-Popham (A.O.C.-in-C., A.D.G.B.) while in the second car were the Prince of Wales and Air Chief Marshal Sir Edward Ellington (Chief of the Air Staff), and in the third the Duke of York with Air Vice-Marshal P. H. L. Playfair, A.O.C., Western Area. The three cars then drove slowly along each line of squadrons, beginning with No. 43 F.S.

When the Royal car came opposite No. 19 F.S., on the left of the front line, the King alighted and was shown a "Gauntlet" by Sqn. Ldr. J. R. Cassidy, while a camera gun was explained to him by another officer. The car halted again opposite No. 3 F.S., and the C.-in-C. presented to him F/O. Donaldson, the best shot in the Fighting Area, Group Capt. W. V. Strugnell, and W/O. J. S. Eley. The last two have the longest service in the Royal Air Force and its predecessors of any individuals still serving. In fact, it is a curious coincidence that when the King inspected No. 3 Squadron on Laffan's Plain in 1913 (it was then commanded by Major Brooke-Popham) J. S. Eley was present on parade with it as a boy mechanic. No. 12 B.S. was the next squadron to be

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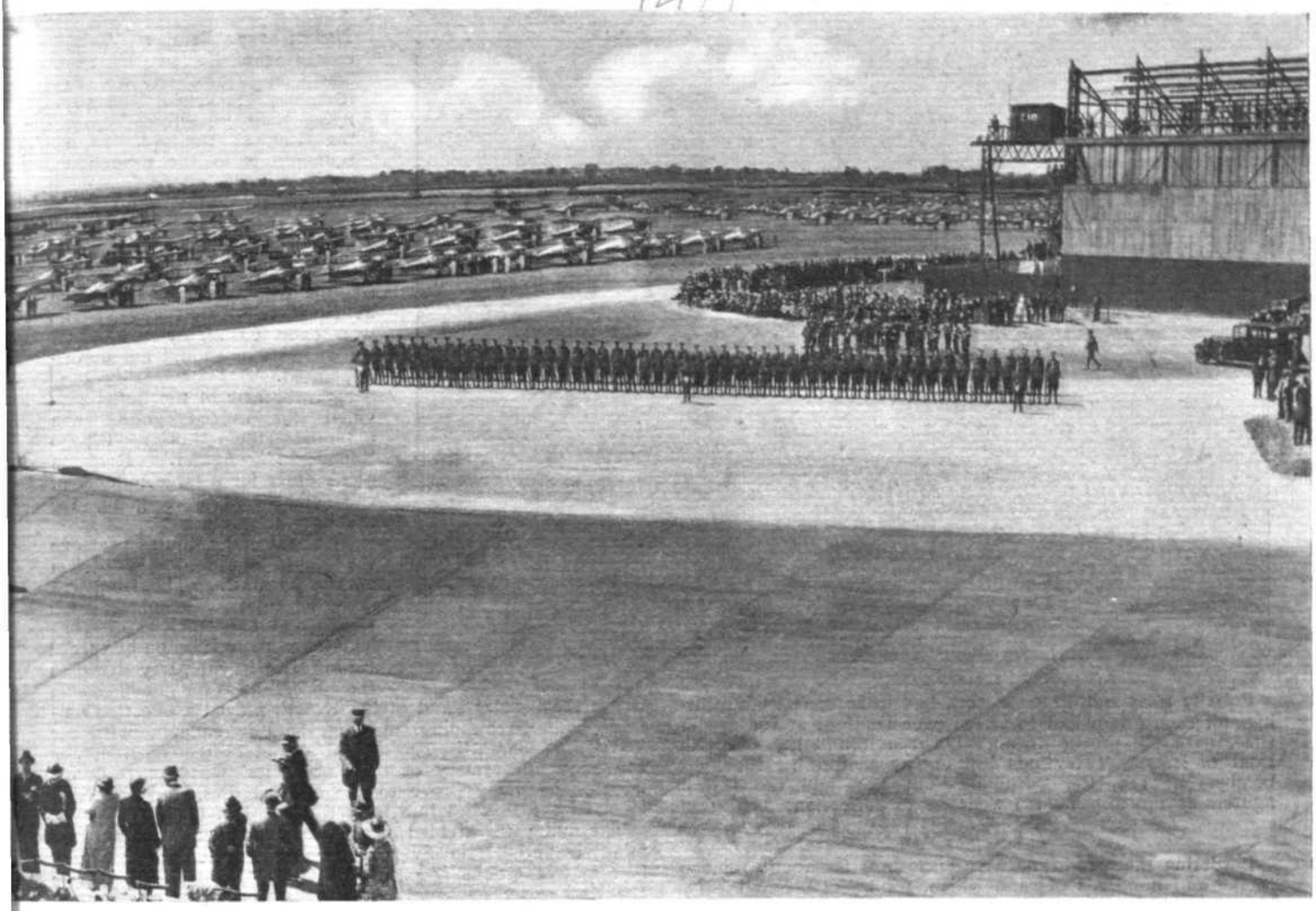

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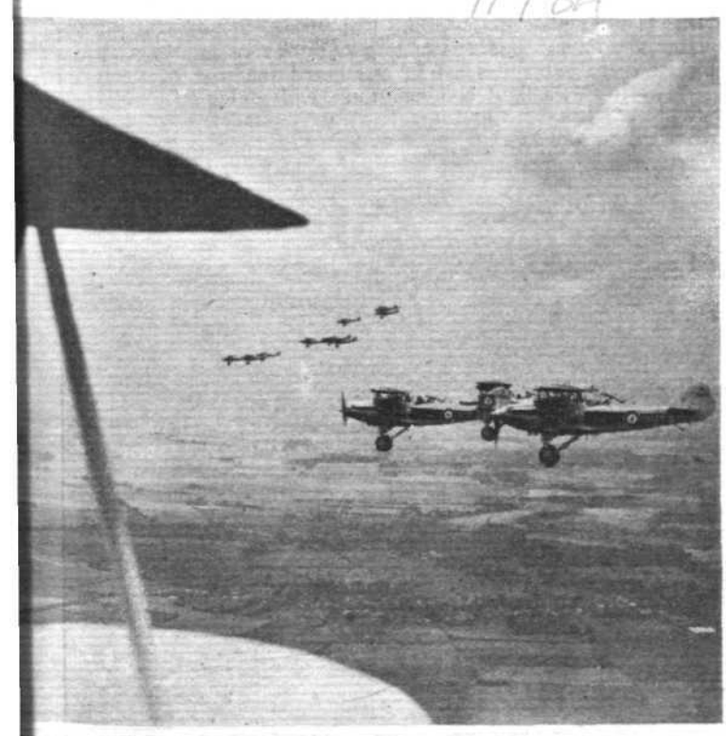


specially noticed by the King, and this squadron has well earned distinction by its continued excellence for many years past. Certain items of aircraft equipment were there explained to His Majesty by two corporals of No. 23 F.S. Another halt was made opposite the "Overstrands" of No. 101 B.S., and Sqn. Ldr. Betts explained to the King the marvels of the revolving gun turret in the nose. Sergt. Thrussell was there presented to him as the best bomb aimer of 1934. The "Heyfords" of No. 99 B.S. also received special attention from the King. The inspection occupied about three-quarters of an hour, though it must have seemed many times that length to the guard of honour, who stood "at ease," but might not stand "easy."

On returning to the Royal Standard, the King invested Sir Robert Brooke-Popham with the insignia of G.C.V.O., Air Vice-Marshal Playfair, who was in command of the flying, with that of C.V.O., and Wing Commander P. E. Maitland with that of M.V.O. All three decorations had been thoroughly well earned by masterly staff work. The King and Princes then drove off to Duxford. The first part of the review had gone off with brilliant success.

Immediately Mildenhall became a scene of desperate but entirely ordered activity. The take-off area had to be cleared and taxi-ing lanes laid open. Squadrons at the rear were, so to speak, hustled out of the way and huddled under the boundaries of the aerodrome. The "Kestrels" of the "Heyfords" were started and warmed up for a quarter of an hour. Taxi-ing lanes appeared as though by magic, and airmen bearing yellow flags, under the control of an appointed officer, showed the way for the squadrons. Then a "Heyford" began to trundle out of the serried ranks and make its way towards the base of the take-off area. It was followed in single file by nineteen others, comprising Nos. 10 and 99 B.S., and one by one they all took the air and formed up into flights of five each. Heavy bomber squadrons do not specialise in formation flying, and the air was very bumpy, but for all that they made a creditable show, and flew off to mark time in an appointed area. Each of the five groups had its own appointed area for waiting until the hour came to head for Duxford. The country over which they had to fly was featureless, and their areas had to be marked for them by red smoke candles. After the "Heyfords" there went the 'Harts," "Audaxes" and "Demons," eight squadrons in all, organised in two groups, and they took off by flights. Then six squadrons of "Bulldogs" made up the fourth group, while the three squadrons of "Furies" and the one "Gauntlet" squadron made the fifth. The fighters all took off by squadrons. All got clear of Mildenhall in excellent order, and the sky was full of squadrons, as the groups formed up and flew off to their allotted areas. It was perhaps the most striking piece of organisation in the whole of the review.

The Heavy Bomber Wing, consisting of No. 99 (Bomber) Squadron (above) and No. 10 (Bomber) Squadron (below) flying their "Heyfords" past the King at Duxford. Each squadron is in the formation "flights astern."
(*Flight* photograph.)

Equally good and accurate work had to be done while waiting, for each group had to arrive over Duxford at the proper time, with the proper distance between it and the group in front of it, the "Heyfords" flying at 98 m.p.h., the light bombers at 115, the "Bulldogs" at 120, and the fastest fighters at 140 m.p.h. All went off to perfection.

At *Duxford*

Bordering the aerodrome were enclosures for about 100,000 people and hundreds of cars, which, for hours before the fly past was timed to start, began to fill. Through the main aerodrome gates passed a slow stream of cars bearing the official guests. The Royal dais was decorated in blue and silver—the Jubilee colours—and the blue, silver and maroon of the Royal Air Force.

The sky was about seven-tenths covered with big cumulus clouds (members of the Service were forecasting bumpy conditions for the fly-past), but at every opportunity the brilliant sun shone through the blue gaps.

There was a pronounced Ascot touch in the enclosure provided for guests, the splendour being enhanced by vivid Oriental costumes and the variegated full-dress uniforms donned for the occasion by members of the armies, navies and air forces of several countries. Few, apparently, noticed a red and blue D.H. "Rapide" speeding by: it had brought H.R.H. the Prince of Wales from Fort Belvedere to Newmarket, whence he was to join the Royal party.

During the morning a running commentary on the happenings over at Mildenhall was broadcast, and, with the aid of a diagram in the official programme, visitors were able to follow the progress of His Majesty and to visualise the vast assembly of aeroplanes.

Additional entertainment was provided by the very excellent pipe band from No. 1 School of Apprentices, Halton. The announcer wisely explained the nature of the impending fly-past, pointing out that it was in no sense a display such as is given at Hendon, so that any visitors who expected highly spectacular demonstrations should not be disappointed.

In the centre of the buffet provided for official guests was mounted the Gloster F.7/30 "four-gun" fighter. Rumours of an order for a large number of these machines were going the rounds.

At about five minutes past one the Royal Standard was broken on the flagstaff. The King had arrived from Mildenhall; the Queen and the Duchess of York had travelled to Harston by special train. The Royal party drove to the officers' mess for lunch, during which the Central Band of the R.A.F. played a selection outside the mess building, opening, happily enough, with the "Wedding March." The day, it should be remembered, was the 42nd anniversary of their Majesties' wedding. Lunch ended, the party drove to the covered dais, and the King received the Royal salute from the guard of honour.

The flying was divided into three phases. First came what might be termed the fly past proper, in which the machines flew in five groups according to type. Dead on time came the dark-green "Heyfords" of Nos. 99 and 10 (Bomber) Squadrons, droning along at about 1,000ft., with tails well down; they were doing less than 100 m.p.h. As the leader drew level the King rose to the salute, which he held until the last machine of the group had passed. Obviously the big Handley-Pages were contending with severe bumps. From somewhere two miles astern one heard the roar of thirty-six "Kestrels"; a light bomber group, embodying the "Harts" of Nos. 57, 15, 18 and 142 (Bomber) Squadrons was coming

The King at Mildenhall with the Prince of Wales and the Duke of York. He has stopped to inspect the "Heyfords" of No. 99 (B) Squadron.

The King taking the salute at at Duxford. Behind His Majesty are the Queen, the Prince of Wales, the Duke and Duchess of York, the Maharaja of Kashmir, and Lord Trenchard.

over. The King rose again. The effect on the rearmost units of the turbulent air still further churned up by the preceding squadrons was readily apparent, but station-keeping was very accurate.

A composite group next passed before the dais. This was composed of No. 12 (B) Squadron ("Harts"), Nos. 2 and 26 (Army Co-operation) Squadrons, equipped with the "Audax," and the "Demons" of No. 23 (Fighter) Squadron. The six "Bulldog" Squadrons, Nos. 3, 17, 111, 32, 54 and 56 flew in well-spaced "layers," so that the last machines were at less than 800ft. Finally, there came the fastest fighting aircraft in the Royal Air Force, three squadrons of "Furies" (Nos. 1, 25 and 43), and the "Gauntlets" of No. 19 (F) Squadron.

This last unit, which actually is stationed at Duxford, then returned and gave an exhibition of squadron air drill. In the main it was similar to that given at Hendon on the previous Saturday, and was a very accurate performance, although for some reason the various formations were assumed in a different order from that given in the programme. The verbal orders of the leader came over the loud speakers as clear as a bell.

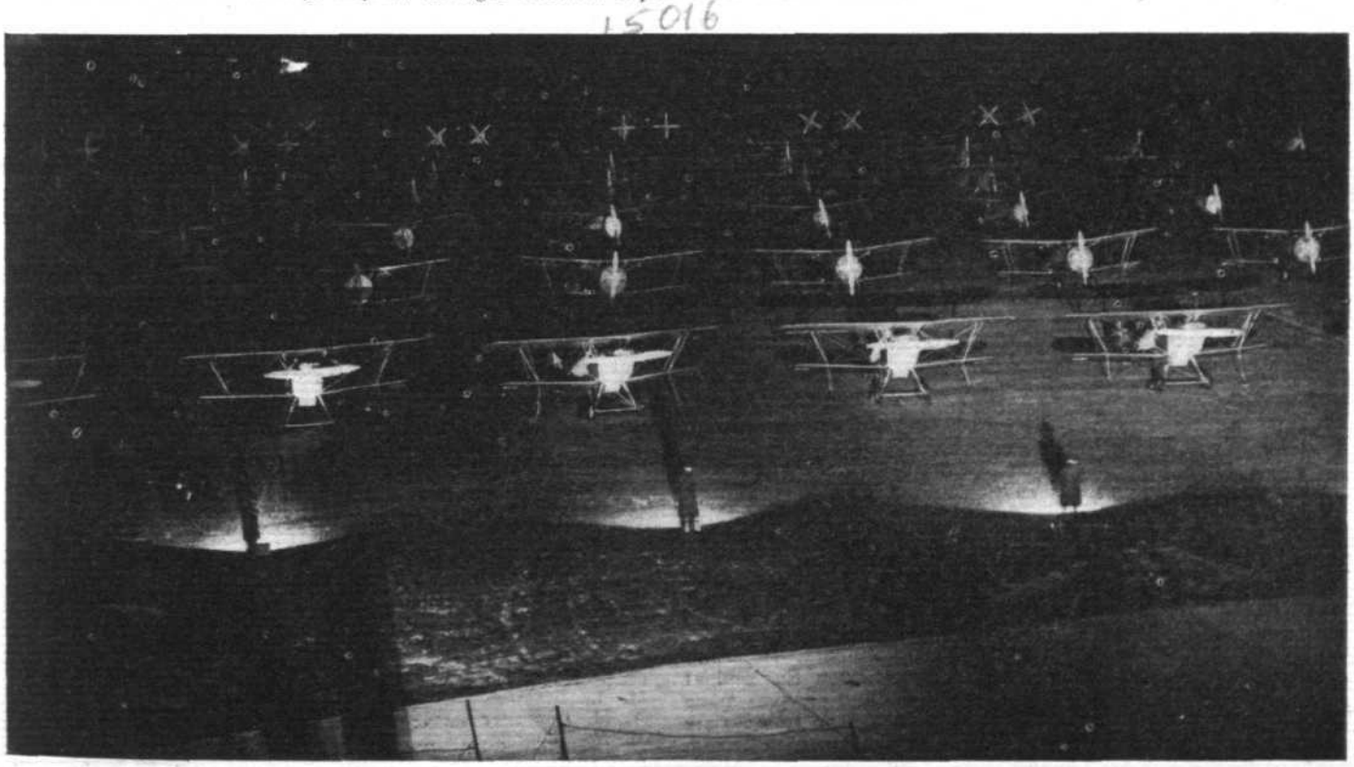
The various formations presented were: Squadron echelon starboard; flights echelon starboard; flights astern; flights in line astern; squadrons vee; flights abreast, and squadron formation. In this last the "Gauntlets" did a shallow dive before the King, and flew away to Henlow. Finally, in the third phase, seventeen squadrons, made up of 155 machines, flew past in wing formation, the wings being disposed in line astern. The two "Audax" squadrons had been sent home, leaving seventeen squadrons divided into six wings.

The heavies came over at 98 m.p.h., the light bombers kept throttled back to 115 m.p.h., the "Bulldogs" flew at 120, and the fast fighters at 140 m.p.h. This time the King did not rise but watched intently from his seat.

As the mighty droning lessened in the distance he stepped from the dais. Once again the Royal salute was given, and the crowd rose as a man. The King had reviewed his Air Force.

The crowd then dispersed, and traffic difficulties on the roads must have occupied the thoughts of the drivers. When calm reflection became possible, one cannot help wondering what impressions the public carried away from the review. It is quite possible that the layman, taking in only what his eyes showed him, thought the fly-past lacking in thrills. Such a view would be very superficial. The R.A.F. can fly with as much spirit as anyone on the proper occasion. This review aimed at displaying efficiency, and nothing more efficient has ever been achieved.

15016



Night scene at Mildenhall when the massed aeroplanes were illuminated by mobile searchlights. (*Flight* photograph.)

Correspondence

The Editor does not hold himself responsible for the opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.

HENDON TACTICS

[3050] With reference to the report in the July 4 issue of *Flight* describing the Hendon Display, in the account of the Tactical Training event, it is stated that, when the "Demons" took up position beneath the "Wallaces," "although they seemed in a place of absolute safety, one apparently succumbed to spontaneous combustion, and went down. . . ."

As I was in the A, west enclosure, I probably had a better view of the particular episode, being perhaps a thousand yards nearer than members of the staff of *Flight*.

When the "Demons" first took up positions below the "Wallaces" they sat beneath their tails, positively screaming to be shot down. One "Demon" paid the price of bad tactics, and the remaining two immediately moved forward to the more strategic position, ahead of the "enemy."

The error was, I thought, deliberate, to add point to the correct tactics subsequently used. Would the same methods have proved successful against "Overstrands"?

As an enthusiastic amateur and regular reader, I should like to take this opportunity of wishing *Flight* every success.

London, N.8. F. W. LAND.

MOTORISTS AND THE R.A.F. DISPLAY

[3051] One of the first engagements which I make on the occasions of my leave home from India is the R.A.F. Display at Hendon, and on previous occasions I have taken or joined a small party which went to one of the 5s. enclosures and used our cars for the purpose of watching the flying. This year we could not arrange a party, but my wife was with me in our car and a friend in his own car, and we reached Hendon at 11.30 a.m. with the intention of going into the West 5s. enclosure.

I had with me my copy of *Flight* dated June 27, and made use of the map on page 725, but, on approaching the aerodrome, I missed Colindale Avenue and so turned into Montrose Avenue, where there were a number of both police and R.A.F. men on duty. I inquired for the entrance to the 5s. enclosure and was told to go back and along Booth Road. There was nothing at the entrance to the No. 1 car park to show that it was an entrance *also* to the 5s. enclosure, so I went on and found myself at the entrance to the 10s. enclosure, where there were innumerable police standing about, as well as R.A.F. personnel at the gateway. No one seemed to know how access was obtainable to the West 5s. enclosure, and I was even told that cars could not be taken into that enclosure, and in desperation I eventually went into the 10s. enclosure.

I should be interested to hear whether my experience was unique or whether other spectators were similarly treated, because there seemed to be rather a lack of co-operation between the police and R.A.F. authorities. At the entrance to the 10s. enclosure I was hustled unceasingly by the police, who would not even allow me to wait for my friend to come after he had put his car into the External Park No. 2.

Ingatestone, Essex. HUSTLED.

SPAR DESIGN

[3052] I am obliged to Mr. N. A. de Bruyne for his appreciative remarks and for drawing my attention to the work of Prof. W. Prager, which I hope to have the opportunity of studying shortly, since refinements in calculations are always welcome.

From N.A.C.A. Report No. 181 on form factors it was realised that wood spars do not follow exactly the simple theory of bending; but this is at present an accepted method in the Air Ministry's Airworthiness Handbook, which may be regarded to a certain extent as empirical. A more exact method is presumably not insisted upon, as the maximum loads which the spars have to sustain are also empirical.

Portsmouth. J. F. CUSS.

TERRITORIALS AND OVERSEAS SERVICE

[3053] In the Editorial Columns of your issue of June 20 you say "Defence of the Home and is the undertaking of the Territorial Army, and its men cannot be sent overseas without a further act of volunteering."

This statement almost exactly describes the essential difference between the Territorial *force* of 1907-1914 and the Territorial Army of to-day.

When the citizen army was reconstituted after the War it was announced that home defence was no longer its only rôle. The Territorial Army is available to reinforce any overseas expeditionary force, and can be sent abroad after the passing of an Act of Parliament authorising its despatch.

Every officer and man, on joining the T.A., has to sign an agreement accepting liability for service overseas.

Warwickshire. TERRITORIAL OFFICER.

MONOPLANE OR BIPLANE?

[3054] In "The Outlook" in your issue of June 20 you comment on the respective merits of these two types. As I see it, the only advantage in the low-wing monoplane is that it is more efficient and therefore faster. Against that, if one does have the misfortune to "nose over" it is bad for the occupants, added to which one must employ fuel pumps.

The biplane or the high-wing monoplane provides for very much simpler fuel feed and gives the pilot some protection from the sun, which is often very important. There is also a better view of the ground, but, conversely, that of the sky is not so good.

The writer has tried all three types and only wishes that there was a high-wing two-seater open monoplane available.

Coventry. PRIVATE OWNER.

IN BRIEF

Mr. E. H. Wilson (Leicester) writes to point out that the best performance in the power-driven models class at the recent rally of model aero clubs at Sywell was made by his own high-wing monoplane (18 c.c. "Comet" engine), and not by another machine as reported.

FOR LOWE-WYLDE'S CHILDREN

IT is not generally known that the three orphan children of the late Mr. C. H. Lowe-Wylde (who was killed in 1933 while testing a "Drone," a type which he pioneered) are practically unprovided for. At the instance of Mr. E. C. Gordon England, F.R.Ae.S., a fund has been organised, and a total sum of £1,100 is urgently required to ensure the upbringing and education of the three children, who will be cared for by St. Elizabeth's House, Bullingham, Herefordshire. Donations should be sent to Mr. Gordon England at the London Air Park, Feltham, Middlesex, and cheques made payable to the Lowe-Wylde Memorial Fund. The trustees are Lord Sempill, A.F.C., F.R.Ae.S., Kathleen, Countess of Drogheda, C.B.E., and Air Comdre. J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E.

The first list of donations is as follows:—

	£	s.	d.
Lord Wakefield	50	0	0
Sir John Siddeley	26	5	0
C. R. Fairey	25	0	0
Handley Page	25	0	0
The Bristol Aeroplane Co.	20	0	0
G. Brewer	10	10	0
A. J. A. Wallace Barr	10	10	0
Robert Blackburn	10	0	0
Flight Publishing Co., Ltd.	10	10	0
Sir Herbert Austin	5	5	0
M. L. Bramson	5	5	0
A. M. Desoutter	5	5	0
B. W. Brady	3	3	0
The Hon. Mrs. Victor Bruce	2	2	0
Major Barlow	1	1	0
The Dowager Lady Swaythling	1	1	0
H. H. Balfour		10	6

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

Aircraft at the Naval Review

The fly-past by the Fleet Air Arm during H.M. the King's Review of the Fleet at Spithead next Tuesday will take place at 5.30 p.m. It is understood that about 100 aircraft will take part.

On the Air

"Wings Everywhere" is the encouragingly prophetic title of a talk to be given in the Western programme of the B.B.C. by F./O. C. R. Cubitt at 9 p.m. on July 31. It will deal with the impressions of an air line pilot.

An Indian Appointment

Mr. Gerald Leslie Gandy, of the Directorate of Civil Aviation of the Air Ministry, has been appointed to the post of Deputy Director of Civil Aviation in India. Mr. Gandy left England by air on June 25 for New Delhi.

A Home-powered "Pou"

Mr. Brook, of York County Aviation Club, is assembling a "Pou" in which he will eventually install a special engine made by the Scott Company, of motor cycle fame. The cost of the machine, without power plant, has been about £5.

Quick Delivery

Captain Hubert Broad last Friday ferried the second "Comet" for the French Government from Croydon to Le Bourget in 50 minutes, undercutting Mr. Buckingham, his colleague, who took over the first French "Comet," by three minutes.

Fifteen Hours in a Glider

A remarkable glider flight of record duration was made recently by the German pilot Siegfried Ruhnke. Carrying a passenger in a Grunau "Baby 8" sailplane, he remained in the air from 3.12 p.m. on June 29, until 6.9 a.m. on the 30th—14 hours 57 minutes.

A Fraternal Feat

The Keys brothers who, as recorded last week, have broken the world's duration record (with refuelling), eventually landed at Meridian, Mississippi, after having been aloft for 27 days 5 hours 33 minutes. The previous (unofficial) record was 26 days 23 hours 28 minutes.

London University Air Squadron

It has been decided that London University Air Squadron will begin to form on October 1 next. Flying facilities will be provided by the Station Flight at Northolt, and the Town H.Q. will be at the Imperial College of Science and Technology at Kensington. Wing Cdr. F. H. M. Maynard, A.F.C., will, it is understood, be appointed chief instructor.

REGAL ENTHUSIASM. H.M. the King of the Belgians attended the recent display of the Belgian Air Force at Evère. He is seen with Queen Astrid after alighting from the Fairey "Fox" in which he had flown.

The Soviet Amazons Again

Six Russian girls have made a parachute descent of 23,130ft. without oxygen apparatus. The hands of one were so numbed that she could not, at first, pull the rip cord. Her clothing was frozen solid.

QUIS? The King's Cup, principal award in the King's Cup Race, to be flown on September 6-7. Entries close at 5 p.m. next Monday.

American Aircraft for Spain

A report from Madrid states that a military mission is about to leave Madrid for New York for the purpose of buying fifty fighter aircraft for the Spanish Military Air Service. The mission will also purchase ten engines for the Spanish Naval Air Force. The Parliamentary Budgetary Commission has approved an additional vote of twelve million pesetas for the purchase of new aircraft.

For Research at Cambridge

The Vice-Chancellor of Cambridge University announces that he has received a letter from Sir John D. Siddeley offering to the University £10,000, spread over seven years, for the purpose of helping the development of aeronautical research, particularly in order to assist the work of Professor Melvill Jones and his associates in the subdepartment of aeronautics in the University.

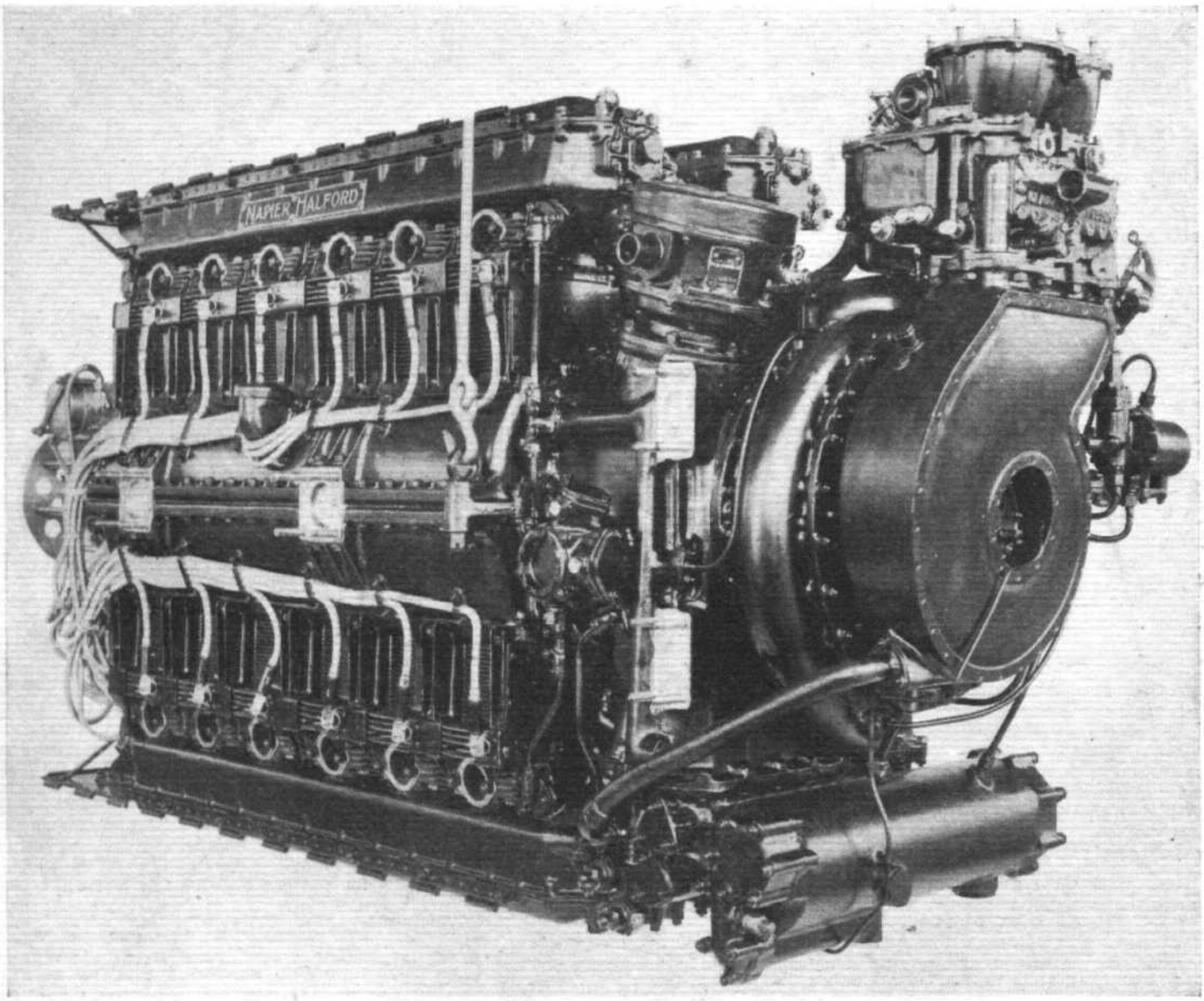
Twenty-five Years Ago

From "Flight" of July 9, 1910.

"Experiments in dropping dummy bombs on imaginary warships were carried out by Mr. Glenn Curtiss on the 1st inst. before naval and military officers. The shape of a battleship was marked out by flags on Lake Kimka, and out of twenty missiles dropped by Curtiss, eighteen are said to have hit the mark."

THE NAPIER-HALFORD "DAGGERS"

Twenty-four-cylinder H-type Engines Fully in Production : Low Specific Weight : High Output per Litre Capacity : High Power for Small Frontal Area



This three-quarter rear view of the "Dagger" shows, among other components, the down-draught Claudel-Hobson carburetter. The oil filters are housed in the cylindrical casing below the supercharger.

DESIGNED by Major F. B. Halford, who recently became a director of the Napier firm, and built at the Acton Works of D. Napier and Son, Ltd., the "Dagger" engines have now definitely gone into production, and a squadron of the R.A.F. is to be equipped with Hawker "Harts" fitted with this unit. Two models are available at present, the Series II, which is fully supercharged to 12,000ft. and the Series III, which is a medium-supercharged type, with a rated altitude of 5,000ft. The two engines are generally similar except for the degree of supercharge, and the following description may, therefore, be taken to apply to both.

As a result of this unorthodox design, using a large number of small moving parts, a high engine speed can be attained, and the "Dagger III," for example, develops nearly 48 b.h.p. per litre capacity. The small engine size tends in itself to reduce air drag, and the particular arrangement of the cylinders reduces the drag still further, because of the very small frontal area. In this way the "Dagger III" develops no less than 115 b.h.p. per square foot of frontal area at maximum r.p.m.

From the point of view of specific weight, the "Dagger III" is also an economical engine, weighing but 1.57 lb./b.h.p., based on maximum power.

Fundamentally the engine is similar to the Napier-Halford "Rapier" series described in *Flight* of March 14, 1935, except that it has twenty-four cylinders instead of sixteen, and certain of the mechanical details are different, apart from the six cylinders per bank as against the four cylinders per bank of the "Rapier." The outstanding feature of both types of engine is the arrangement of the cylinders in the form of a letter "H" as seen from the end. The connecting-rods of opposite banks work on a common crankshaft, of which, therefore, there are two. These are geared at their forward ends to a common airscrew shaft, the opportunity being taken to provide a reduction in airscrew speed; the gear ratio is 0.372 to 1. The same cover on the front of the engine houses the drives to the B.T.H. magnetos and distributors, which are

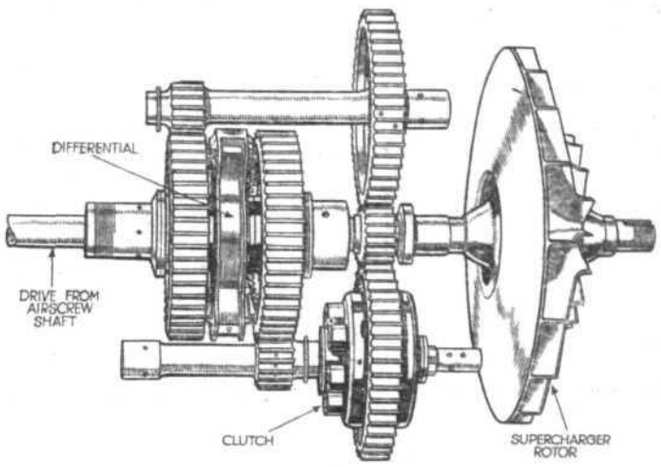
mounted above and below the airscrew shaft respectively. The crankshafts are carried in eight lead bronze-lined bearings.

Separate close-finned steel cylinder barrels are used, but the cylinder heads, which are of forged Hiduminium R.R. alloy, are built up to form units with the overhead camshaft casings. These units are drawn down on to the cylinder barrels by four long steel studs per barrel. An aluminium sealing ring is fitted between each barrel and cylinder head. There is one inlet and one exhaust valve per cylinder, and, of course, two sparking plugs, which are of K.L.G. manufacture. The valves are operated by one overhead camshaft per bank through rockers fitted with hydraulically operated self-adjusting tappets.

Pistons of simple design, made of "Y" alloy, are used, each being provided with two gas rings and one scraper ring, the latter at the lower end of the skirt. Fully floating gudgeon-pins are secured by circlips and chamfered rings, and pressure-fed bushes are used in the small ends of the Albion drop-forged connecting-rods. These differ from those of the "Rapier" in that instead of one master rod and one auxiliary rod in each pair, one has a plain big-end and the other a forked one. The forked rods have fixed lead bronze-lined bearings, and the plain rods bear direct on a lead bronze-covered portion of the outside of the shell. Power is transmitted to the drives at the rear of the engine through a tubular centre shaft extending rearwards from the airscrew shaft and lying between the two crankshafts.

Air deflector plates for the cylinder banks are supplied as standard parts of the engine, the makers having carried out extensive research on the best arrangement for combining low drag with adequate cooling.

The timing case unit at the rear of the engine houses the drives to the camshafts, oil and fuel pumps, generator, air compressor and gun gear. A further central extension from the centre shaft drives the supercharger, which is carried on the rear of the timing casing. The gearing for the impeller of the supercharger incorporates a differential gear which transmits the power equally to two layshafts. One of these has a spring-loaded clutch to provide protection against sudden overloads.



The blower drive incorporates a differential gear which transmits the power equally to two layshafts, one of which has a spring-loaded clutch to protect the drive against damage from sudden overloads when accelerating or decelerating.

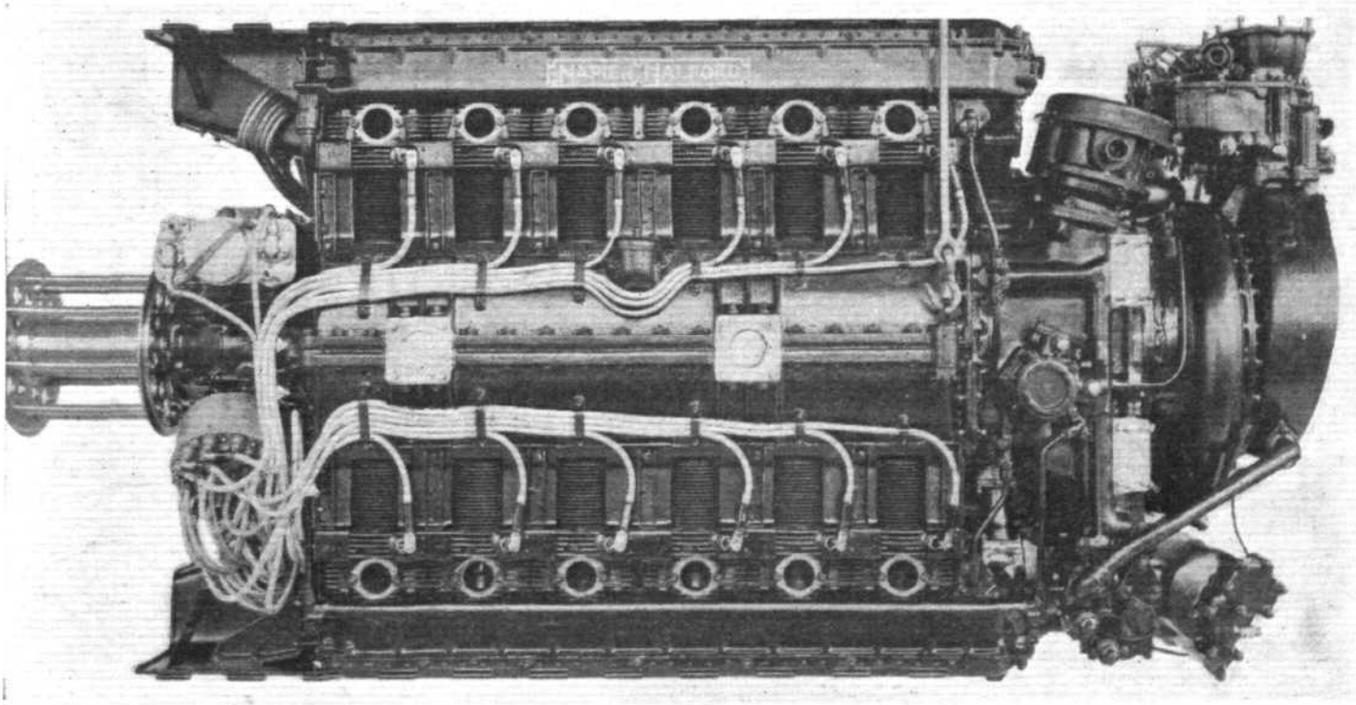
To cope with the somewhat difficult conditions which require dual ignition for twenty-four cylinders a specially designed ignition system is used. This comprises two double magnetos and two twenty-four-point distributors. Each magneto unit feeds both distributors. Fully screened and bonded ignition wires to the plugs are provided.

A Claudel-Hobson twin-choke carburetter fitted with automatic boost control, accelerator pump, power jets and enrichment jet delivers mixture into the inlet volute casing of the supercharger. The volute is partially oil jacketed.

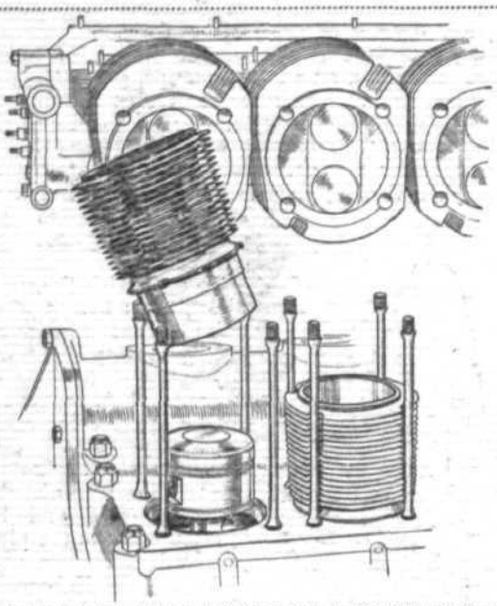
A conventional dry-sump lubrication system is used, with high- and low-pressure circuits. The low-pressure is controlled from the high-pressure circuit by a simple pressure-reducing valve. The oilpumps are of the gear type, one for high-pressure delivery and two for scavenging the front and rear ends of the crank case. The pressure oil is passed through a Tecalemit felt filter before going into the engine, and the scavenge oil passes through gauze strainers

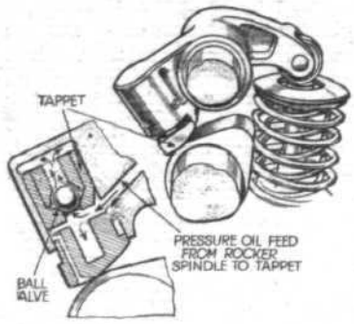
THE NAPIER "DAGGER III"

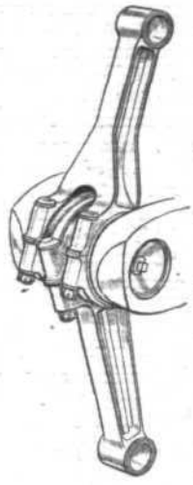
TYPE: 24-cylinder "H" air-cooled.
DIRECTION OF ROTATION: Left-hand Tractor.
BORE: 3⅞in. (*96 837 mm*).
STROKE: 3¾in. (*95 250 mm*).
SWEPT VOLUME: 1,024.8 cu. in. (*16 793,4 cc*).
NORMAL B.H.P. at Rated Boost: 700–725 at 3,500ft.
NORMAL SPEED: 3,500 r.p.m.
MAX. B.H.P. at Rated Boost: 780–805 at 5,000ft.
MAX. SPEED: 4,500 r.p.m.
TAKE-OFF POWER at Max. Boost: 730–755 b.h.p. at 3,500 r.p.m.
FUEL CONSUMPTION, cruising at 390 b.p.h.
At 3,100 r.p.m.: 23.5 gals. (*107 litres*) per hour.
OIL CONSUMPTION: 5–10 pints (*2,8–5,6 litres*) per hour.
WEIGHT: 1,270 lb. (*577 kg*).



As can be seen from this side view of the Napier-Halford "Dagger III," all accessories with the exception of the B.T.H. magnetos and distributors are grouped at the rear end.







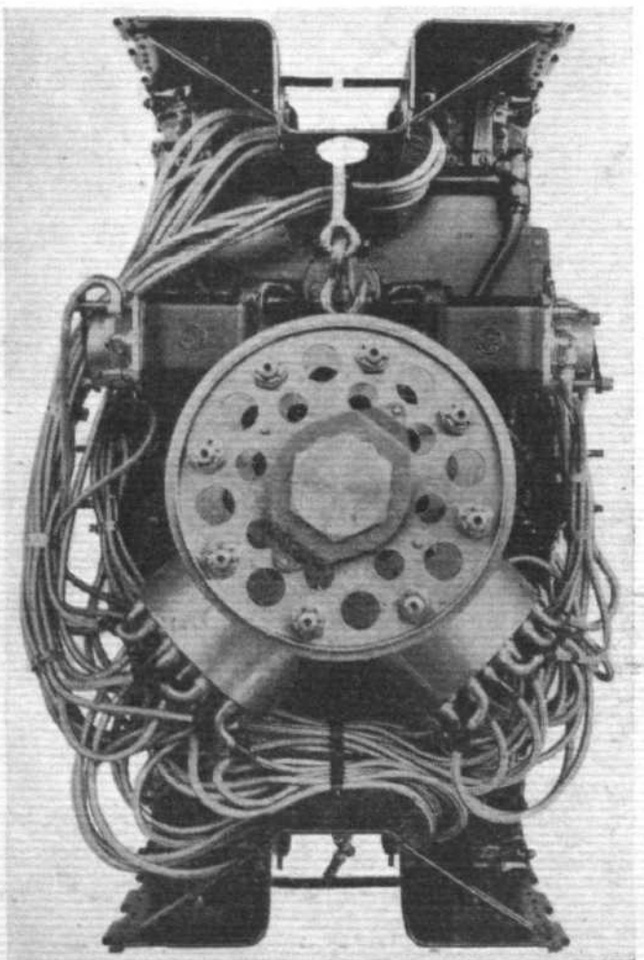
Some "Dagger" details. The steel cylinder barrels are held down to the crank case by long steel studs which pass through the fins of the aluminium alloy cylinder heads ; these form header units with the overhead camshaft casings, as shown on the left. Above are details of the valve rockers, which are fitted with hydraulically operated self-adjusting tappets. On the right is a pair of connecting rods ; one is plain and the other forked.

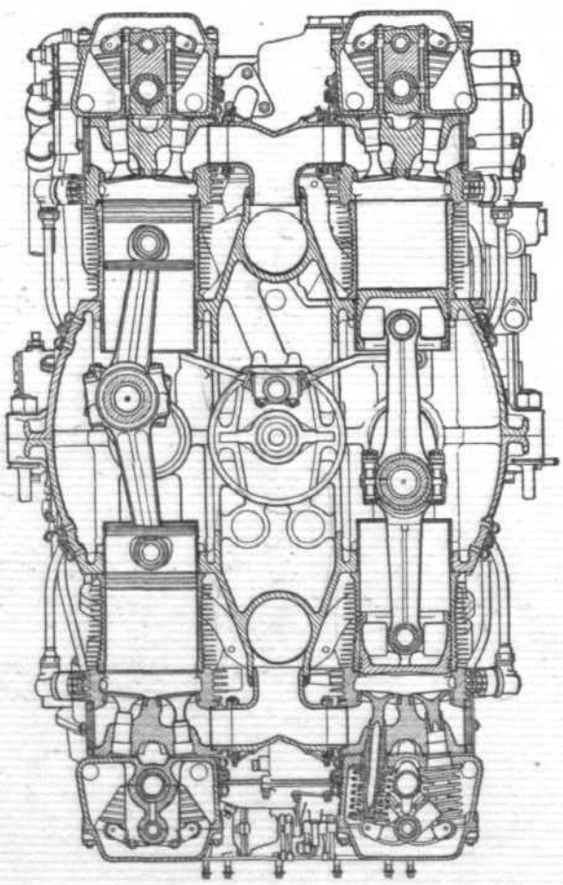
before being returned to the tank. The pump gears, relief and pressure-reducing valves, filter and strainers, are all grouped together in a compact unit bolted to the bottom of the timing casing.

High-pressure oil lubrication is used for the main and big-end bearings of the crankshafts, the small ends of the connecting-rods, and reduction gears. The timing gears, blower gears and valve gear are lubricated by low-pressure oil. Splash oil is relied upon for the lubrication of cylinders and pistons.

As previously mentioned, the Napier-Halford "Dagger II" is similar to the "Dagger III," but has a normal power at rated boost of 670-695 b.h.p. at 3,500 r.p.m. at 10,000ft., and the maximum power at rated boost is 730-760 b.h.p. at 4,000 r.p.m. at 12,250ft. Take-off power at maximum permissible boost is 710 b.h.p. at 3,500 r.p.m. The fuel consumption at a cruising power of 475 b.h.p. at 15,000ft. is 27 gallons per hour (123 litres per hour) or 0.42 pt./b.h.p./hr.

From these details it is immediately obvious that the Napier-Halford "Dagger" is both compact and economical, at the same time offering designers an engine for which no radiators or liquid cooling systems are required. The fact that air has been used successfully to cool an engine of this size, and, moreover, one which is so compact, rather suggests that the day is not far distant when we shall see aircraft designed with the engines laid flat in the wings, where they will create practically no drag at all.





On the left is a front view showing the special B.T.H. magnetos and distributors placed close behind the airscrew boss. The sectional drawing on the right explains the unusual arrangement of cylinders, crankshafts and gearing.

A Modern Carpetbagger—Part III

OVER the LAND of the AZTECS

Further Stages in a Fourteen-day 16,000-mile Airline Journey Round America Made by a Member of the Staff of "Flight"

By C. N. COLSON

FROM Cienfuegos, Cuba, we made across the sea in the Sikorsky S.40 for the middle of Jamaica. On the way I had the unique experience of seeing eight whales altogether on or near the surface of shallow water. The clearness of the water makes it quite difficult to know whether you are looking right down through it in many places or whether the reefs you see are above the surface; it would be interesting to try some photographs from an Autogiro or small airship in that part of the world, and with plates which would register colour, because the blues, greens and yellows are marvellous.

(Top) Uninviting country in Mexico; some attempt at cultivation can be seen on the right of the gorge. (Centre) A Mexican Airport Customs Office—at Tapachula. (Below) The Douglas D.C.2 at Mangua, the capital of Nicaragua

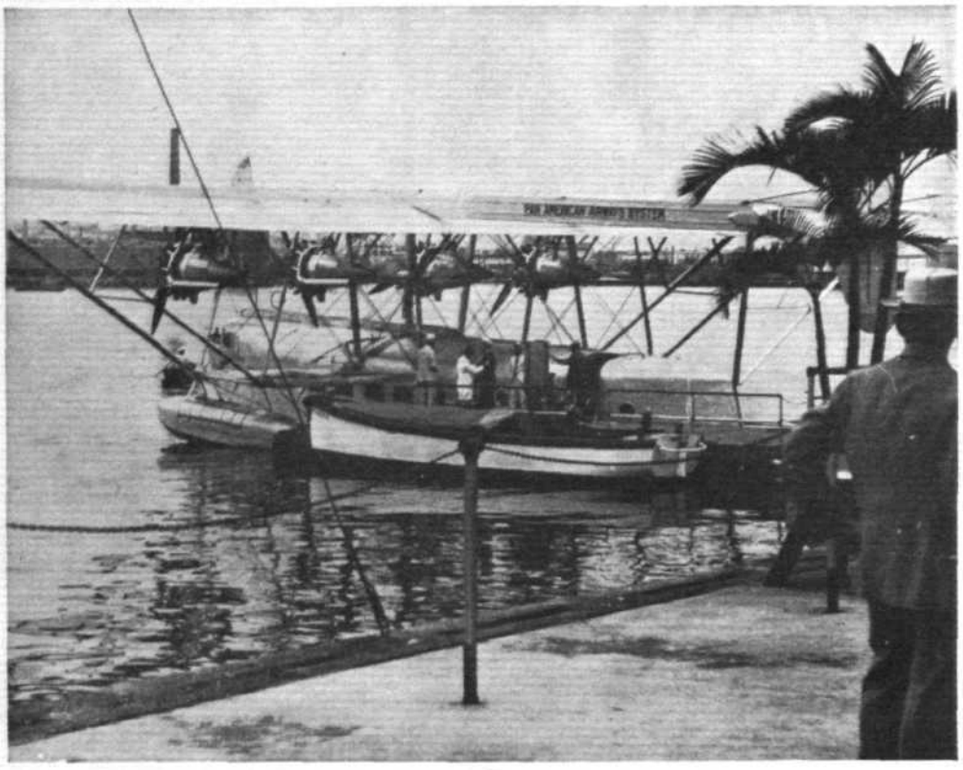
As I was accustomed to the 150 m.p.h. or so of the S.42, I found the 100 m.p.h. of the S.40 somewhat tiring, particularly because it was accompanied with considerable noise, so I was glad when the Blue Mountains of Jamaica got closer, and at last we started flying over that British island. I would have given a great deal to have been able to stop over and see for myself the result of British administration. Even immediately on landing one could discern a sense of well-being and contentedness which was patently absent from the republics I had seen within the previous few days. Of course, they have their troubles, but there is little doubt that British methods do make for satisfied inhabitants and a prosperous Colony. Perhaps the most striking thing to one who has never been in that part of the world is the lack of half-castes in the islands under British administration as compared with the republics and those which have been under Spanish and French rule; and from what I was able to see and learn this fact alone makes for peace and contentment.

We landed right up at the eastern end of Kingston harbour, where there is seldom any swell even in bad weather. It means a long drive which costs 3s. each way, a tall order when one has no option about it.

A Far-famed Hotel

As we arrived rather late that evening it was dark by the time we reached the far-famed Myrtle Bank Hotel, so, with the before-dawn start in mind, I curbed my desire to investigate the island and turned in soon after a belated dinner.

Next morning the journey to Barranquilla, in Colombia, was uneventful. Those with good eyesight could have seen innumerable shoals of flying-fish playing leap-frog with the waves. It puzzles me how these fish know the wind's direction—they certainly do know, for they always leap down-wind.



A Sikorsky S.40 flying boat alongside the landing stage in Havana

The Colombian Government has the same camera complex as have the Italians, and when I left Kingston I had to have my camera sealed—a futile proceeding because, though there was a great deal of scenic beauty, there was absolutely nothing of any real military importance which I could have taken; but I wasn't allowed to have the camera back until I was beyond the Canal Zone.

Barranquilla is at the mouth of the Magdelena River, a vast, muddy efflux which colours the ocean for over forty miles out from the coast—a perfect "landmark."

The Sergeant-Major

Scadta Airways run into the interior, so the hangars were full of various machines tended by German mechanics. A German, who I am sure must have been a sergeant-major, was in charge of the landing party; what with the torrential tropical rain, the fast-flowing, winding tributary up which we had to go to the slipway, the mass of floating débris, and other little *contretemps*, I have no doubt we should still be trying to get alongside if the party (mostly locals) had been in hands other than his.

We had to change boats here, going on board a Consolidated "Commodore," another well-tried veteran which has done good work for Pan American in building up their system. The coast after Barranquilla is just one large dent, and we saw nothing except water until we came to the San Blas Islands, somewhat to the east of Colon. The inhabitants, the San Blas Indians, are rather interesting, as they have so far successfully opposed every attempt to inculcate so-called civilisation into them. White men are allowed to visit their villages, but must clear out before dark. There is a well-known American in Colon who is said to have made a fortune out of these Indians by bartering alarm clocks in exchange for cocoanuts; the clock is only for euphonious purposes—the alarm he always rewinds for them—at a price, in cocoanuts!

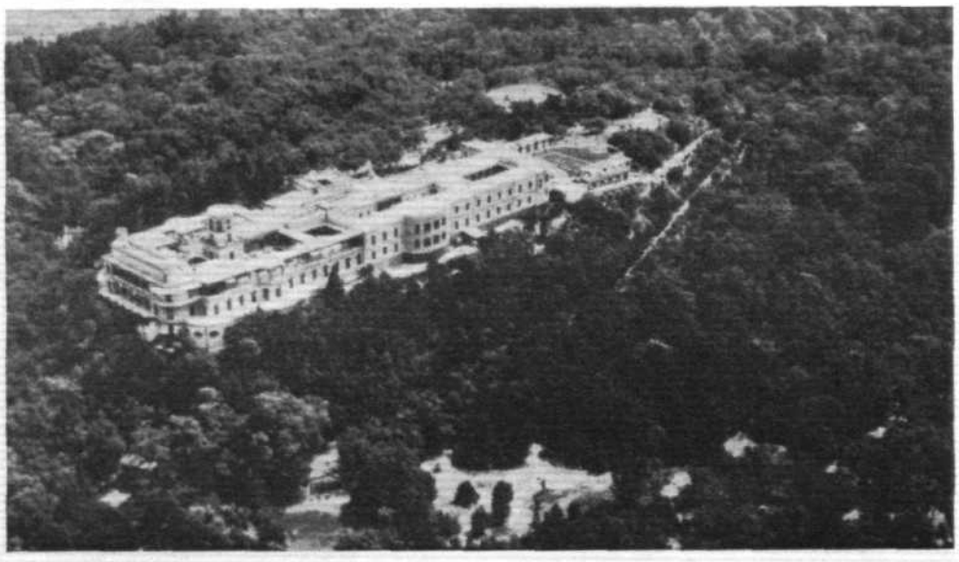
The Navy's Way

Cristobal, where we landed in the Canal Zone, is a U.S. Navy Base, and Pan American have to make use of what facilities they are granted by that Service. From the passengers' point of view this is not too good, because the "Commodore" is brought up to a slipway, where landing wheels are shipped, and then the boat, still with the passengers on board, is pulled up by a tractor. She assumes a considerable angle when the tail comes out of water, and the women squeak with apprehension—but the Navy does not mind that!

Colon—Cristobal seems to be the name for the area around the Navy base, while Colon is the Panamanian town inside the Canal Zone—is the steaming nucleus of the Americas. People of every race under the sun congregate there, yet few whites would have been able to live in the area at all had not John D. Rockefeller sent his medical men to kill the mosquitoes. The Canal Zone is controlled by the United States, but the towns of Colon and Panama, although inside the Zone, come under the Panamanian Government.

In Colon I found journalistic people jubilant—they had some news! Not just the fact that a man had bitten a dog: Oh! dear no, something much better—a baby had been found that morning waving in its hand a small, black and very poisonous snake, the head of which it had bitten off with impunity! In a place like Colon that is indeed news!

Next morning a new phase of the journey started, for I left the sea. I changed to the Douglas D.C.2 run over



Chapultepec Castle, where the rulers of Mexico City have lived for years

the Central American routes by the Western Division of Pan American Airways. It started from France Field, where the U.S. Army fly in the Zone.

This stage was so interesting as to be overwhelming. We travelled up through Panama—after flying over much of the Canal, which was disappointing from the air because Gatun Lake forms such a large proportion of it and through the lake it is impossible to see where the channel lies—then on to Costa Rica, where the finest coffee in the world comes from, and made a landing at the capital of the country, San Jose.

Costa Rica is a lovely country—the sort of place to which I should like to retire. They don't seem to have any labour troubles, their income-tax is very low, the financial condition of the country is said to be very sound, the climate at San Jose is ideal (the aerodrome there is at an altitude of over 3,000ft.), there is all the hunting and fishing one can want and, with it all, there is not too much civilisation.

High Flying

From then on it was all high-altitude flying: through Nicaragua, landing at Managua; Honduras, landing at Tegucigalpa; Salvador, landing at San Salvador; and Guatemala, landing at Guatemala City. The country is wild and moutainous, with enormous stretches of jungle and forest and—what to me was the most interesting part of it all—lots and lots of volcanoes, many of which were smoking merrily. Volcanoes are extremely interesting from the air, because one can look down into the crater much more safely than when climbing up their steep sides. These volcanoes were somehow less sophisticated than are Vesuvius and Etna, which are, more often than not, covered with trippers. They really look their part, and later on I hope to be able to give a more detailed description of those I saw. I obtained many photographs of them, though only through the window glass of the Douglas, but despite this handicap a large number are worth publishing.

We stayed the night at San Salvador. It is not exactly the place one would choose for a comfortable holiday, but unless you insist on all home comforts you can get along quite well there. They have a nice little air force—three Curtiss "Hawks," three Waco trainers and two other machines. When they had the last revolution they didn't have the "Hawks," so the Government had to make do with the Wacos. They did it well. An observer was put in the back of each with a Thompson sub-machine gun and a load of home-made bombs (cocoa tins with fuses which had to be ignited!) and the three went off to demonstrate that the Government would stand no nonsense. Just 2,500 corpses proved their efficiency! Unfortunately, this whetted their appetite, so they went on practising their bombing, choosing the aerodrome to do it on. They hit it sometimes and did not always admit it, so when we were taking off we dropped in one of the holes they had left. However, a tractor soon pulled us out, and in a few minutes we were up about 10,000 feet, cooling off nicely.

Unloading the forward mail compartment of the Douglas

Warm Work

Some of those places are hot, and the inside of an all-metal machine such as the Douglas becomes furnace-like; then, when you get up to your cruising altitude of between 8,000 and 14,000 feet you get too cold—it is all very trying and takes a bit of getting used to. As a matter of fact, the whole question of climate needs to be investigated to see whether or not the results of the excessively rapid climatic changes due to fast travel by air are likely to be harmful to anybody. An overnight

An Aztec pyramid at Teotihuacan, outside Mexico City

journey can now take you from a temperate climate to the tropics, a change which many people find too much for them.

Leaving Guatemala and its volcanoes, we entered Mexico at Tapachula, in the province of Chiapas, one of the richest in that vast rich country of Mexico. Among the Express freight which was brought on board here was a pair of love-birds in a small wickerwork basket. They were chirping loudly, but gradually lapsed into silence when we got to 11,000 feet—I wondered at what height they would pass out altogether and whether people who send birds and animals by air ever think about that aspect.

After all the health and customs formalities had been settled we oozed back into our "furnace," and left the Pacific for the Atlantic again at Vera Cruz. Talking about the oceans reminds me of an interesting fact which few people seem to realise; that is that Panama lies to the south-east of Colon. At Colon the sun sets "in" the Atlantic, although you can almost see across the isthmus. I couldn't get my bearings there for some time—it seems difficult to understand that the Canal does not run east and west. There is a story—probably grossly exaggerated—of a U.S. Army pilot who took off from Colon to fly to Panama without a map; he headed roughly west, and after a few hours got worried and landed . . . in Costa Rica!

A *Matter of History*

Just before reaching Vera Cruz aerodrome we passed the oilfields at Minatitlan, which founded the Pearson (Cowdray) fortunes. Thinking of Hernando Cortes and his landing in 1519 made me ponder on what differences there would have been in this vast country to-day if that expedition had been led by an Englishman. The Spanish and English—pirates, buccaneers, call them what you will—must have been grand men; they at least had the courage of their convictions and cared not a fig for what anyone thought of them. I found a part of British Honduras named after one of my ancestors—we had some fine old pirates in our family, as the City of Bristol knows to its lasting benefit—and it gave me quite a kick to think of covering practically the whole of the country in less than two days while that old man must have taken years to get a few miles!

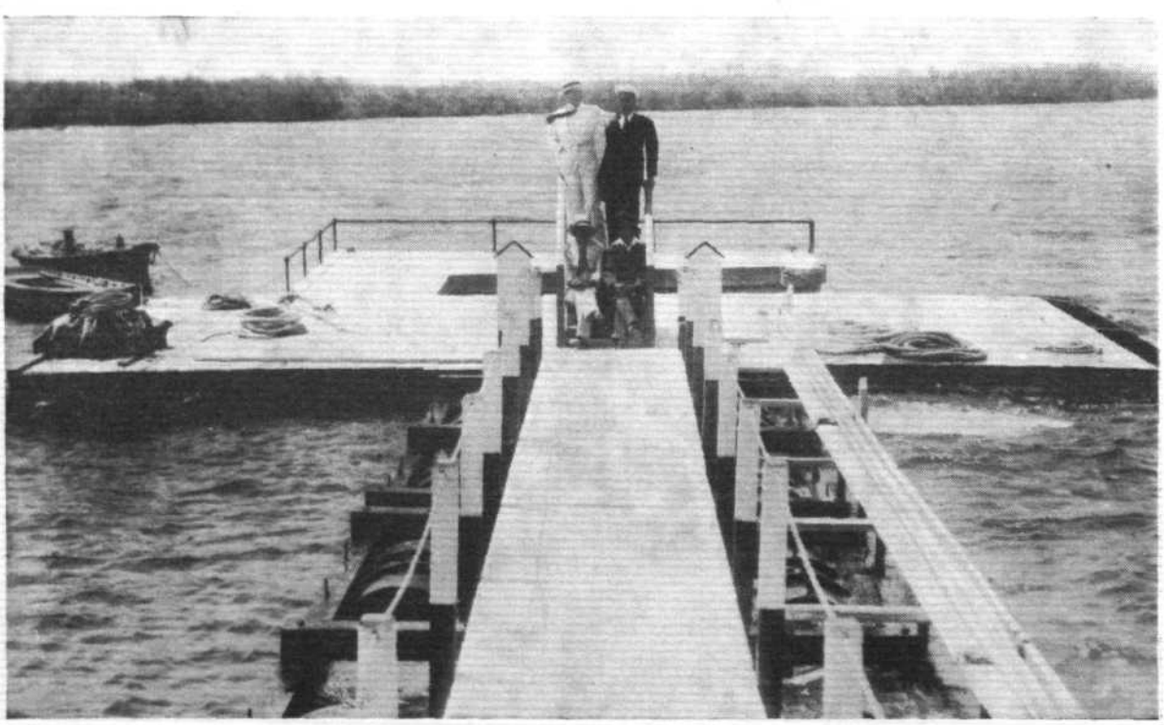
After Vera Cruz we went in across country to Mexico City—poor old Cortes, it almost seemed wrong to think of the time he took over that journey! The weather was not good, and most of the mountains were hidden from sight, although we were flying at over 14,000ft. a great deal of the way. We made a diversion round by Pachuca, where the silver mines are working overtime for Roosevelt, and did not break through the murk until we came out into that huge, salty, dusty, dried-up lake bed in which Mexico City, at 7,400ft., is built. The lake used to be full of water, and in the days of Cortes and Montezuma the gardens and vegetation around the city were marvellous, but one of the many revolutionary Governments—under Diaz, I believe—has dried it up by draining, so now it is very hot and dusty.

Two volcanoes overshadow the city and the airport, Popocatepetl and Ixtaccihuatl—known as Popo and the White Lady—and their snow-capped heads look invitingly cool after the humid furnace called an air-liner by mundane-minded air-operating companies. These god-like guardians of the inhabitants of the city rumble and vomit no longer, but, from the stories I heard about other parts of Central America, I would not trust them entirely. Almost any mountain out there seems capable of flooding the country with lava or boiling mud without giving due notice in writing!

Mexico City is not the sort of place you can assimilate in a few moments. You have to talk and think Spanish, or, better still, Aztec. A short visit gives you time only to scratch the surface, let alone become used to working at that altitude. They do themselves well in the matter of food; there is plenty of variety provided you do not mind eating the delicacies of the country. Some people live there for years and years and never think of trying gusanos de maguey, those luscious great maggots which thrive in the base of the leaves of the maguey cactus. The Pan American Airways officials showed me how to eat them fried and rolled up in piping hot "tortillas." Then there is the fruit—mamey, papaya, and the more recently imported Manilla mangoes and many other varieties.

Sometimes they have revolutions to enliven things, but they are getting a bit soft now; the old days of Zapata (who used to let the maguey cactus kill his prisoners by tying them down so that the centre spike grew up through them), Villa and others seem to be over, but there are many parts of Mexico where the Aztec blood is thicker than the Spanish, and—well, it's a country in which anything might happen, but it's no good trying to hurry!

(To be continued.)



One of the floating pontoon type of landing stages used by the Pan American flying boats

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

CHANGE IN HIGHER COMMAND

The Air Ministry announces the following appointment:—Group Captain Wilfred Ashton McClaughry, D.S.O., M.C., D.F.C., to be Officer Commanding British Forces, Aden, with effect from a date in September, 1935, vice Air Commodore Charles Frederick Algernon Portal, D.S.O., M.C.

Grp. Capt. W. A. McClaughry was appointed to a commission, as 2nd Lieutenant, in the Australian Imperial Forces in 1913 and was seconded to the Royal Flying Corps, as a Flying Officer, in June, 1916. During the war he served in France and besides gaining the D.S.O., M.C., and D.F.C., was mentioned in despatches on three occasions. In 1919 he was appointed to a permanent commission as Squadron Leader in the Royal Air Force, and resigned his appointment in the Australian Imperial Forces. He became a Wing Commander in 1929 and was promoted to his present rank in July, 1934. Grp. Capt. McClaughry has completed courses at the Royal Air Force Staff College and the Imperial Defence College and his Royal Air Force appointments have included the command of No. 8 (Bomber) Squadron both in Iraq and Aden, and several appointments on Air Staff Duties. Since September, 1934, he has been in command of the R.A.F. Station, Heliopolis.

FLYING TRAINING SCHOOLS

New Flying Training Schools will be opened before long at Peterborough, Montrose, Thornaby, Ternhill, and Wittering.

THE CENTRAL FLYING SCHOOL

The Central Flying School will move from Wittering to Upavon before the middle of September.

No. 2 (ARMY CO-OPERATION) SQUADRON

No. 2 (A.C.) Squadron will move from Manston to Hawkinge before the end of the year.

THE GLOSTER F7/30

At the annual meeting of Hawker Aircraft, Ltd., Mr. T. O. M. Sopwith stated that an order had been placed by the Air Ministry for a number of the latest Gloster day-and-night fighters. This machine, which is a development from the "Gauntlet," was on view at Duxford when the King reviewed the R.A.F.

HALF-YEARLY PROMOTIONS

The Air Ministry announces that the undermentioned promotions are made with effect from July 1, 1935:—

GENERAL DUTIES BRANCH

Air Vice-Marshal to be Air Marshal.—C. L. N. Newall, K.C.B., C.M.G., C.B.E., A.M.

Air Commodore to be Air Vice-Marshal.—H. M. Cave-Browne-Cave, D.S.O., D.F.C.

Group Captains to be Air Commodores.—J. C. Quinnell, D.F.C.; A. A. Walser, M.C., D.F.C.; L. D. D. McKean, O.B.E.; J. S. Travers Bradley, O.B.E.; W. S. Douglas, M.C., D.F.C.

Wing Commanders to be Group Captains.—D. Harries, A.F.C. (promoted under the provisions of the last sentence of Paragraph 354 (b) King's Regulations and Air Council Instructions); G. S. M. Insall, V.C., M.C.; D. G. Donald, D.F.C., A.F.C.; I. T. Lloyd; R. Collishaw, D.S.O., O.B.E., D.S.C., D.F.C.; C. G. F. Modin, D.S.C.; Sir C. J. Q. Brand, K.B.E., D.S.O., M.C., D.F.C.; N. H. Bottomley, A.F.C. (Acting Group Captain); H. G. Smart, O.B.E., D.F.C., A.F.C.; A. H. Peck, D.S.O., M.C.; G. C. Bailey, D.S.O.

[The other promotions are held over till next week].

ROYAL AIR FORCE GAZETTE

London Gazette, July 2

General Duties Branch

The following are granted permanent commissions as Pilot Officers with effect from February 28 and with seniority of the dates stated. (Substituted for the notification in *Gazette* of March 12):—E. A. Howell (May 28, 1933); R. A. I. Harrison and J. P. Sloan (November 28, 1933).

F/O. D. G. Morris is granted a permanent commission in this rank (June 27); P. White is granted a short service commission as Acting Pilot Officer on probation with effect from and with seniority of June 14. (Substituted for the notification in the *Gazette* of June 25). Lt. R. E. Gunston, R.N., is reattached to the Royal Air Force as a Flight Lieutenant with effect from June 21 and with seniority of April 1.

The following Pilot Officers on probation are confirmed in rank on the dates stated:—J. W. Hathorn (May 16); D. E. Cattell, R. A. Charles-Auckland, D. J. North-Bomford, G. I. Pawson, L. H. Pomeroy, E. A. Verdon-Roe (June 4).

The following Flying Officers are promoted to the rank of Flt. Lt. (June 14):—F. F. Wicks, D.F.C., E. S. D. Drury, W. H. Kyle, R. V. McIntyre.

The following Pilot Officers are promoted to the rank of Flying Officer (June 16):—M. Dawnay, A. T. D. Sanders, G. C. Eveleigh, J. N. Knowles, C. J. P. Flood, A. V. Sawyer.

The following Pilot Officers are granted seniority with effect from the dates stated. (Substituted for the notification in the *Gazette* of March 12):—W. F. Beckwith, G. H. Foss, P. E. Hadow, W. G. Bannister (May 28, 1933); P. B. B. Ogilvie (November 28, 1933).

Air Comdre. A. W. Bigsworth, C.M.G., D.S.O., A.F.C., is restored to full pay from half-pay (June 24); Flt. Lt. R. Whitaker, M.B.E., is placed on the retired list (June 28).

The following Flying Officers are transferred to the Reserve, class A (June 27):—G. J. S. Chatterton, A. J. McDougall.

The short service commission of Acting Pilot Officer on probation J. D. S. Todd is terminated on cessation of duty (June 19).

The short service commissions of the following Acting Pilot Officers on probation are terminated on cessation of duty (July 3):—H. R. Rittey, E. A. Sprange.

The following Flying Officers are promoted to the rank of Flight Lieutenant (June 11):—M. L. Jones, C. V. Mears.

Dental Branch

Flt. Lt. J. M. Jamie, L.D.S., is transferred to the Reserve, class D (July 1).

Commissioned Signals Officers

The following Warrant Officers are granted permanent commissions as Flying Officers on probation with effect from and with seniority of May 31:—P. Allerston, A. W. Daniels, C. Turl, D.S.M.

Commissioned Armament Officer

Warrant Officer G. Bird is granted a permanent commission as Flying Officer on probation with effect from and with seniority of May 31.

Memoranda

302384 Flight Cadet W. R. Charter is granted an honorary commission as a Second Lieutenant, with effect from the date of demobilisation. The permission granted to Sec. Lt. H. F. Walker to retain his rank is withdrawn on his enlistment in the Territorial Army (February 5).

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

The following Staff Nurses are appointed to the permanent service (July 1):—Miss E. M. Grunnah, Miss R. F. Beech, Miss M. Jopp.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

P/O. G. W. Bennett is promoted to the rank of Flying Officer (June 20).

The following are transferred from class A to class C on the dates stated:—Flt. Lt. C. W. McK. Thompson (April 5); Flt. Lt. G. L. Gandy (Lt. Cdr., R.N., Retired) (June 26); F/O. J. V. Holman (May 1); F/O. D. C. Evenry (June 29).

F/O. W. R. Bailey is transferred from class AA (ii) to class C (Jan. 22); Pilot Officer on probation R. E. Cowburn relinquishes his commission on completion of service (June 30); F/O. C. F. Wolley Dod (Lt., R.A.R.O.) relinquishes his commission on completion of service and is permitted to retain his rank (February 5); the notification in the *Gazette* of May 28 concerning Flt. Lt. C. A. Elliott is cancelled.

SPECIAL RESERVE

General Duties Branch

J. S. F. Hood is granted a commission as Pilot Officer on probation (May 14).

AUXILIARY AIR FORCE

General Duties Branch

No. 600 (CITY OF LONDON) (FIGHTER) SQUADRON.—J. H. C. Rowe is granted a commission as Pilot Officer (June 5).

Medical Branch

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—I. A. G. L. Dick, M.D., F.R.C.S., is granted a commission as Flying Officer (June 15).

AUXILIARY AIR FORCE RESERVE OF OFFICERS

General Duties Branch

A. D. McNab is granted a commission as Flight Lieutenant in class A (June 5).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander.—A. W. F. Glenny, M.C., D.F.C., to D. of E., Dept. of A.M.S.O., Air Ministry, 24.6.35.

Squadron Leaders.—H. V. Rowley, to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 30.6.35; for Engineer duties. R. St. H. Clarke, A.F.C., to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 30.6.35; for flying duties in Armament Testing Section vice Sqn. Ldr. R. M. Foster, D.F.C. C. H. Harrison, to Home Aircraft Depot, Henlow, 1.7.35; for Engineer duties vice Flt. Lt. H. E. Falkner, H. B. Russell, D.F.C., A.F.C., to D.O.I., Dept. of C.A.S., Air Ministry, 24.6.35.

Flight Lieutenants.—J. E. Allen, to R.A.F. Station, Calshot, 20.6.35. A. D. Gillmore, to No. 202 (F.B.) Squadron, Calafrana, 10.6.35. C. V. Howes, to Home Aircraft Depot, Henlow, 20.6.35. E. C. Lewis, to No. 2 Flying Training School, Digby, 22.6.35. D. L. Evans, M.C., D.F.C., to R.A.F. Station, Farnborough, 30.6.35. G. W. Gay, to R.A.F. Station, Hornchurch, 29.6.35.

Flying Officers.—G. D. M. Blackwood, to No. 25 (F) Squadron, Hawkinge, 1.7.35. H. V. Horner, to Home Aircraft Depot, Henlow, 2.7.35. H. G. Lee, to No. 58 (B) Squadron, Worthy Down, 1.7.35. H. N. G. Ramsbottom-Isherwood, to No. 54 (F) Squadron, Hornchurch, 1.7.35. N. C. S. Rutter, to Home Aircraft Depot, Henlow, 29.6.35. W. W. Stainthorpe, to Armament Training Camp, Lenchars, 29.6.35.

Acting Pilot Officers.—The following Acting Pilot Officers are Posted to R.A.F. Depot, Uxbridge, on 12.6.35, on appointment to Short Service Commissions:—M. P. Casano, E. C. Eaton, D. E. C. Eyres, J. A. Field, J. H. L. Graham, M. W. Hamlyn, R. W. Hase, J. R. Henderson, F. C. Hopcroft, R. W. G. Kitley, L. Maxwell-Muller, G. M. Roddy, W. Simpson, C. B. B. Wallis; P. White to R.A.F. Depot, Uxbridge, 14.6.35; on appointment to a Short Service Commission. The following Acting Pilot Officers are Posted to No. 4 Flying Training School, Abu Sueir, on 28.6.35:—M. P. Casano, E. C. Eaton, D. E. C. Eyres, J. A. Field, J. H. L. Graham, M. W. Hamlyn, R. W. Hase, J. R. Henderson, F. C. Hopcroft, R. W. G. Kitley, L. Maxwell-Muller, G. M. Roddy, W. Simpson, C. B. B. Wallis, P. White.

Accountant Branch

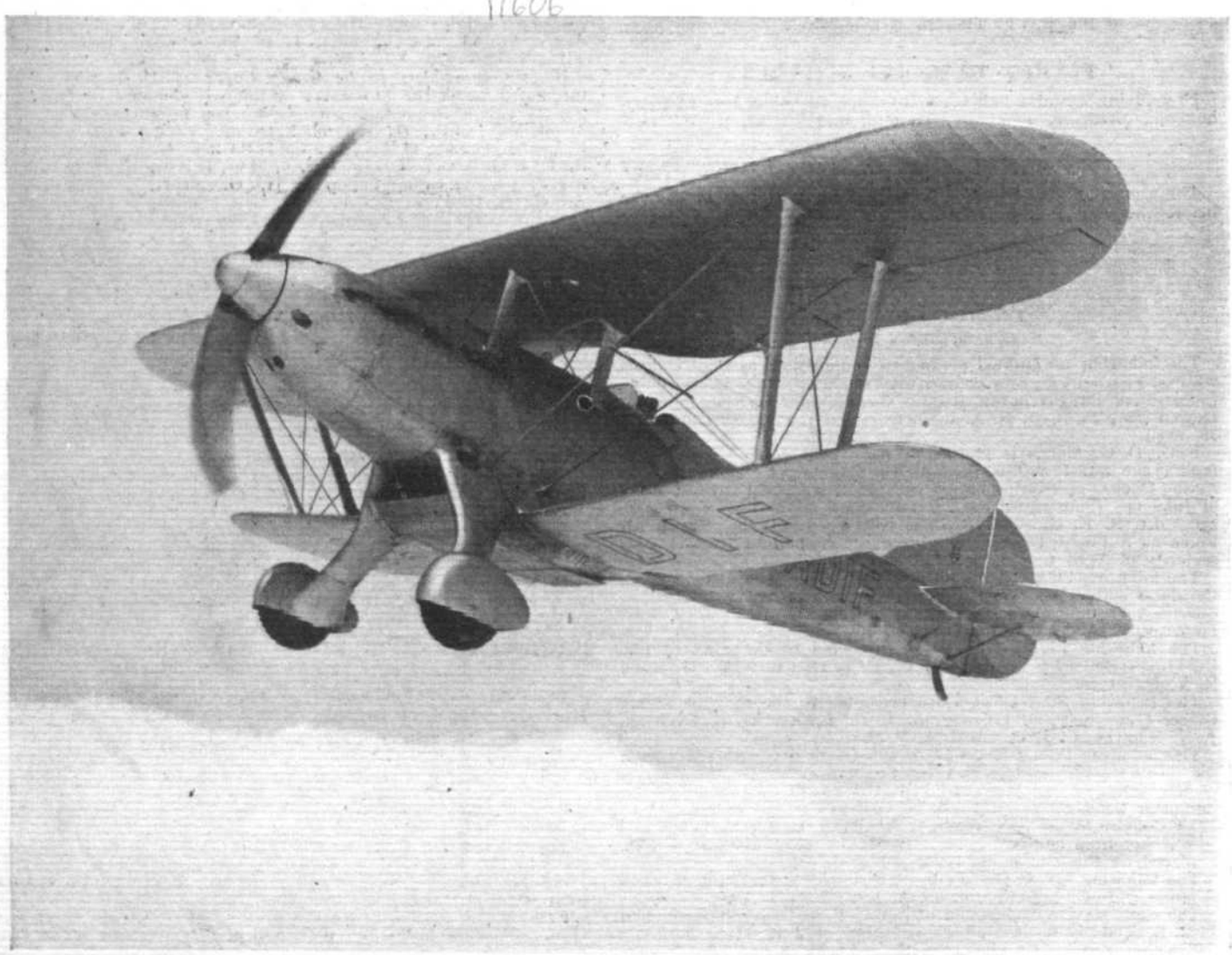
Squadron Leader.—L. de L. Leder, to R.A.F. Station, Andover, 21.6.35; for Accountant duties vice Sqn. Ldr. H. G. Bushell.

Commissioned Signals Officers

Flying Officers.—P. Allerston to R.A.F. Station, Farnborough, 31.5.35; on appointment to a Permanent Commission. A. W. Daniels, to R.A.F. Station, Pembroke Dock, 31.5.35; on appointment to a Permanent Commission. C. Turl, D.S.M., to Reception Depot, West Drayton, 31.5.35; on appointment to a Permanent Commission.

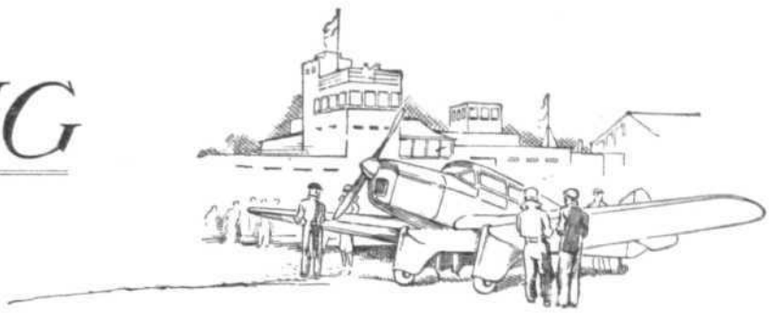
Commisioned Armament Officer

Flying Officer.—G. Bird, to Air Armament School, Eastchurch, 31.5.35; on appointment to a Permanent Commission.



NOT LESS THAN 250 M.P.H.: The "Fantome" entered by the Fairey company for the Belgian fighter competition. Armament consists of a 20 mm. *canon* firing through the airscrew shaft of the 860 h.p. Hispano-Suiza 12Y. brs. liquid-cooled engine, and four Browning guns. Flt. Lt. C. S. Staniland, Fairey's chief test pilot, was flying the machine when this *Flight* photograph was taken.

PRIVATE FLYING



TOPICS of the DAY

Maintenance Work

THERE are several very good reasons why the private owner should be interested in the mechanical side of his machine. Even if he does not feel capable of dealing with, say, the "twenty-five-hour" schedule, which involves cleaning oil filters and draining off the dirty oil, he ought to be able to make minor adjustments and to know where to look for the start of a trouble.

Most young men and women born since 1900, and brought up amidst cars and aeroplanes, wield spanners and grease guns with intelligence, and derive a whole lot of pleasure from their ability to think mechanical problems out for themselves. Last year, however, I met a young man who, though owning a light aeroplane of the more expensive kind, appeared to be doubtful about the direction in which one tightened up the ordinary nut. He complained bitterly about the cost of running his aeroplane.

The Stitch in Time

SO long as a machine is not used for flying for "hire or reward," there does not appear to be any reason why the private owner should not carry out his own maintenance. Legally, one can take it that either he is not permitted to lay a finger on his machine, or, alternatively, that he is under no obligation to do any work on it at all! In actual fact, the inspector does not appear to take any notice of the initials in the log-book, and is much more interested in the number of entries. Needless to say, if no entries are made he assumes that little or nothing has been done during the year, and will call for a fairly staggering overhaul.

In any case, a ground engineer is not always available, and the advantages of spending five or ten minutes before every flight in general inspection are quite obvious. Control cables, for instance, may be beginning to rust and may eventually need to be replaced if they are not dealt with at an early stage; unduly low or uneven tyre pressures may cause a gentle but expensive nose-over if neglected; or the valve tappets may be slightly out of adjustment and may eventually cause an unexpected loss of power just when such power is seriously required.

Minor Problems

CONVENTIONAL biplane types confront the owner with yet another minor problem. If the Raf wires are not inspected carefully these will start to rust, and some people have had difficulty in finding coatings which will not rub off or even flake off in the continuous vibration to which such a coating is subjected. A friend of mine is now testing two very promising enamels, but has, so far, only had six months' experience with them.

If one's machine is kept at a private aerodrome or at one where it is not always possible to obtain skilled attention, it is a good idea to fly it, by way of a practice cross-country when conditions are far from ideal, to some aerodrome where maintenance work is carried out. The ground engineers there may discover, during a cursory inspection, some little point which is shortly to need attention, and, if the job is likely to be a long one, the machine can be flown over again by appointment. In this way log-book entries are made, from time to time, by certified G.E.s.

Playing for Safety

NEEDLESS to say, those owners with private aerodromes should always play for safety and take particular care over their approaches and landings. In such circumstances a damaged undercarriage or engine mounting will result in a very heavy bill, as the owner is unable to fly the machine to the repair shop but must order the repair shop to be brought to him—in some, perhaps, out-of-the-way part of the countryside. Normally these owners would, in addition to such spares as plugs and tail-skid springs and check wires, keep a spare airscrew in the hangar, but in the circumstances, when an airscrew is broken, it is difficult to be certain that nothing else has been either broken or badly strained, and the cautious owner would probably ground his machine until a G.E. experienced in that particular type could be brought to the scene of disaster.

Rules to Remember

A FEW weeks ago, while coming in to land at a crowded aerodrome, another machine passed me on my right and at a slightly greater altitude in a steep sideslip. Since that moment I've been wondering whether all "A" licence pilots trouble to remember the rules and regulations which they learnt, with such mental effort, for their *viva voce* examination.

The rules clearly state that the pilot of the machine approaching at a greater height shall be responsible for avoiding the other, but in overtaking me on my right the pilot was at least partially transferring the responsibility to me. Nevertheless, feeling that he might not have seen me, and that he might make a crab sideslip towards me, I opened up and made a second circuit. So his carelessness cost me a sum of half a crown at club flying rates!

While on the subject it is worth remembering that, when passing another machine, one should not approach nearer than 200 yards; that a machine coming in to land has the "right of way" over another on the ground; that unless one is flying at more than 6,000ft. an aerodrome must be kept on one's left; that aerobatics must not be carried out below this height within three miles of an aerodrome; and that pilots must land on the right of any machine which has either just landed or is about to take off.

INDICATOR.

Private Flying

FROM THE CLUBS

Events and Activity at the Clubs and Schools

TOLLERTON

Two new flying members joined the Tollerton Aero Club last week, and Mr. W. Alton and Dr. Briggs qualified for their "A" licences. The flying time for June, which totalled 154 hr. 30 min., showed a distinct increase over the corresponding month last year. Last week the flying time totalled 44 hr. 20 min.

On Monday, July 1, a third air line started operations from Tollerton, when Provincial Airways opened their Paris and Le Touquet service.

HATFIELD

Three new members—Capt. Carbutt and Messrs. W. G. Pudney and D. Fawcett—joined the London Aeroplane Club last week, during which the flying time totalled 122 hr. 5 min. Eight new members joined the Royal Air Force Flying Club.

The outstanding event of the week, of course, was the record flight to Paris made by Capt. Hubert Broad in the second "Comet" for the French Government. The distance from Croydon to Paris was covered in 52 minutes.

The sales of the "Hornet Moth" have exceeded the most sanguine expectations and have reached a total of eighty in a little over a week.

NORFOLK AND NORWICH

There were many visitors by air to Norwich during last week, including Mr. Malcolm MacDonald, M.P., and Sir Derwent Hall Caine. It is with regret that the club learns that Mr. A. J. S. Morris will shortly be leaving Norwich. He has been one of the most useful and helpful of the club's flying members, and was recently made a director. He is taking up aviation as a profession, and a supper party will be held in the clubhouse next Sunday to bid him farewell.

Sir Alan Cobham's display will be at the aerodrome on Saturday, July 13.

HANWORTH

Seven new members have joined the London Air Park Flying Club during the past fortnight, and three members, Messrs. L. H. Ransom, E. Outram and J. W. Grose, have qualified for their "A" licences. In addition, Messrs. A. Reid and C. F. Hughesdon have completed the courses for their instructor's licences, and Mr. W. P. Barker has made his first solo. Flying times during the past two weeks have totalled 62 hr. 30 min. and 50 hr. 40 min. respectively.

The Committee of the British Empire Cancer Campaign have arranged for the club to provide a flying display which will be held at Aldenham Aerodrome, near Elstree, in conjunction with their garden party on July 27. All funds derived therefrom will be devoted to cancer research, and visiting machines should arrive before 3 p.m.

Last week pupils at the Autogiro Flying School flew a total of 44 hr. 40 min., and eight new pupils have started instruction. First soloists included Mr. F. M. Oliver, who has been trained from the *ab initio* stage; Capt. Briand, of the balloon section of the French Air Force; Mr. O. G. Anderson, and Mr. J. P. Phillips, who made his first C.30 solo.

REDHILL

During the week ended July 5, flying time totalled 81 hr. 10 min. Mr. Robinson did his night flight and finished his "B" licence tests. Three more members started for their blind flying courses and two obtained certificates for their "B" licence endorsement—making a total of twenty who have received certificates since the regulations were instituted.

BROOKLANDS

The greatest excitement was caused last week when Mr. Ken Waller took up one of the Farnham police and assisted in a man-hunt over Frensham. From what we hear, the only suspicious-looking person they pin-pointed turned out to be an inoffensive parson having a quiet nap in the shade.

On Monday a small chance reunion of Australian pilots took place in the club, when Jim and Amy Mollison, Jean Batten, and Ken Waller forgathered and re-flew parts of their journey to the great interest of their hearers. The club held another successful tea dance last Sunday. Miss Barnard and Mr. Alexander successfully carried out the night flight for their "B" licences.

Mrs. Cree and Messrs. Tweedie and Delaney made first solos, and the flying total last week was more than 100 hours.

London Film Productions, Ltd., filmed a very realistic crash on a corner of the aerodrome. Raymond Massey has the principal part, and a Hawker machine was used for one act.

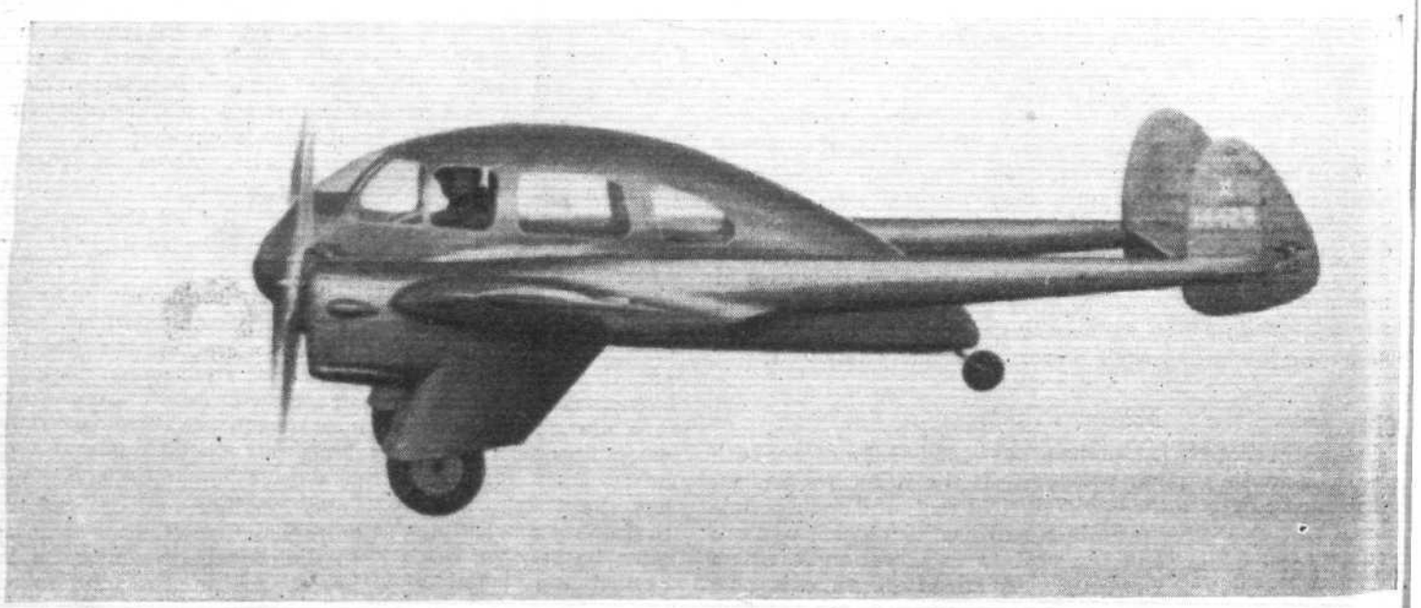
In the notes published in *Flight* of June 27, it was remarked that Mr. Coveney, of the G.Q. Parachutes, made a landing in front of the clubhouse. Mr. Coveney, of course, is employed by the Irvin Air Chute company, and the statement might have given the impression that the two companies were connected in some way. His jump was made with an Irvin.

CINQUE PORTS

The Marquess of Kildare, who learned to fly and obtained his "A" licence with the club, has purchased an Avro "Avian." Mr. Cliff went to Gravesend to collect the machine, and later flew it to Brooklands and handed it over. Miss Margaret Cunnison went through the numerous "B" licence flying tests at Hendon on Tuesday of last week. Another aspirant is Miss Tailyour, the former private secretary to Mr. Arthur Henderson, M.P.

Flying time shows a steady increase, and the total for the week ended last Thursday was 80 hr. 30 min. Mr. and Mrs. Eric Davis left on Thursday of last week, in their "Leopard," for Brussels and Berlin. Mr. Davis is to interview people in Europe to solicit their co-operation for the forthcoming International Air Rally at Lympne. In Berlin he met Mr. Jack Evans, a member of the club, who has done a great deal towards the improvement of liaison between British and German pilots. Great results are expected from this Berlin visit. Friday witnessed the departure of Mr. Kenneth Waller and his mother for Brussels, and Mr. Peter Walton has flown away for a few days in Yorkshire.

Two of the most interesting visitors were Mr. Robert Kronfeld, in his "Drone," who arrived from Berck and left the next day for Hanworth, and the Marquess of Clydesdale, who arrived for the week-end after the Duxford review.



SPEED WITH A DIFFERENCE. The "Crusader" AG-4, which is produced by the American Gyro Co., of Denver, Colorado, seats four people and cruises at 210 m.p.h. with two 156 h.p. Menasco engines. A larger version will carry five passengers and a pilot at a maximum of 237 m.p.h. In this case the two engines will be Menascos of 210 h.p. each.

MIDLAND

During last week the Midland Aero Club's flying time totalled 30 hr. 55 min., and one new flying member, Mr. G. E. Douty, joined the club. Cross-country flights were made to Sywell and Braunstone.

LIVERPOOL AND DISTRICT

Since the beginning of the year and until the end of June, 1,271 hr. 35 min. were put in by the Liverpool and District Aero Club. During June the figure was 305 hr. 20 min., and during last week 75 hr. 10 min. The total flying for June shows an increase of four hours over the corresponding period of last year.

YORKSHIRE

A very substantial increase over last year's comparable figures was shown during the month of June, in which the Yorkshire Aeroplane Club flew 222 hr. 30 min. Last week's total was 52 hr. 45 min. One new pupil, Mr. Hull, is only seventeen years of age. Mr. H. Audsley, the second Air League Young Pilots' Fund pupil to be allotted to Yeadon, has now started his training.

KENT

The Kent Flying Club's time for June shows a marked increase on that during the same period last year. During the past fortnight four new flying members have joined, and Messrs. Green and Chalmers carried out their licence tests.

The officers of the Surrey and Suffolk Yeomanry, who are in camp near Bekesbourne, have been made honorary members of the club during their stay, and Lord Cowdray and Mr. Todd have started instruction.

BRISTOL AND WESSEX

A party of nine members from the Hampshire Club visited Bristol by air on the Sunday before last. Three Bristol Club machines went out to meet the formation and escorted them to Whitchurch and to breakfast. During the week-end there was plenty of club flying in the fine weather experienced.

During June 216 hours were flown by the Bristol and Wessex Club, and Mr. D. A. Taylor made his first solo last week.

LEICESTERSHIRE

The new airport has been singularly busy during the past month. Crilly Airways operated as usual, and Provincial Airways inaugurated their Paris and Le Touquet service. Apart from air line machines, 50 machines visited Leicester during June, and 54 trips were made to 11 different aerodromes.

During the month 118 hr. 35 min. were flown by the club, Mr. E. W. Kennard made his first solo, and Mr. R. D. Bradley passed his "A" licence tests.

NORTHAMPTONSHIRE

Quite a number of people have been taking trial lessons recently at Sywell. Messrs. Jack and Geoffrey Linnell flew to the Boulogne meeting over the week-end, and on Sunday Capt. G. R. D. Shaw brought his new B.A. "Swallow" to Sywell and several of the club members had trips in it.

Club members took part in the Dawn Patrol to Leicester, which was held on Sunday morning. One new flying member last week was Dr. R. O. Lee.

CAMBRIDGE

At Marshall's Flying School the flying time last week totalled 44 hr. 45 min. in spite of the fact that high winds prevented flying on the last two days. During the week Miss R. J. Owen and Mr. Barrington made their first solos, and are now nearly ready to carry out their "A" licence tests.

On Sunday nine members of C.A.S.C. flew, and three machines have been housed at Fen Ditton while their owners were on duty at Mildenhall.

READING

Four "A" licence tests have been passed during the last fortnight by Messrs. Pryce Hughes, J. E. Bligh and Butler and Miss Arabi. Among the nine new pupils is Miss Waldron, who has come from Spain to take her licence, and Mr. Brian Swann went solo in the surprisingly short time of 4 hr. 50 min. Messrs. Geoffrey, Matherson and Ritchie have passed their passenger-carrying tests.

Some five owners have taken delivery of various types of Miles machines recently, and among those staying at the club last week was Sqn. Ldr. McGreggor who, with Mr. Walker, flew a "Hawk Major" so successfully in the England-Australia race. Ten members have qualified to fly the Gerald Royle "Cirrus Hawk." Flying time during last week totalled 64 hr. 20 min.

NEWCASTLE-UPON-TYNE

Although the closing date for entries for the London to Newcastle race was July 10, late entries can still be received until 12 (noon) on July 19 at a fee of five guineas.

The entries so far received are as follows:—

Machine.	Pilot.	Entrant.
Percival "Gull" ...	C. E. Gardner ...	P. Mursell
D.H. "Moth"	L. Lipton	L. Lipton
D.H. "Moth"	J. R. Micklethwait ...	J. R. Micklethwait
Airspeed "Envoy" ...	—	North Eastern Airways, Ltd.

During the last week of June club flying at Cramlington totalled 41 hr. 35 min., and one new member, Mr. R. J. Brown, joined the Newcastle-upon-Tyne Aero Club.

HERTS AND ESSEX

Two members—Messrs. R. J. Jones and R. Masramon de Ventos—made their first solos last week at Broxbourne, and Mr. W. A. Cash has obtained his "A" licence. The flying time totalled 93 hr. 41 min. Seven new members have joined, including Mr. Hans Mager from Germany. Flt. Lt. D. G. Allison has taken over the duties of Mr. W. E. Grieve as assistant instructor.

SCOTTISH

On June 1 a substantial reduction was made in the flying rate of qualified soloists, the effect of which will be to reward the pilot who does the most flying. The pilot's first fifteen hours will be charged at the rate of 30s. an hour as at present, the second fifteen hours will be charged 25s., and all who complete thirty hours in the year will be charged £1 an hour. For the purposes of the scheme flying time will count as from December 1, 1934.

LANCASHIRE

During the past month Mr. D. L. Armitage made a first solo, and blind flying certificates were gained by Messrs. E. F. Palmer, J. G. Hay and J. Millar after courses totalling about 34 hours. The flying time for May was the best experienced during the last four years.

Between July 29 and August 9 the Lancashire Aero Club will be entirely closed. Nine members have recently joined the club.

Replacing Christchurch

BOURNEMOUTH and Poole have decided on a joint purchase of land near Bear Cross for use as a municipal airport—a project which will cost about £15,000. At present, of course, the privately owned aerodrome at Christchurch is known as Bournemouth Airport.

Seeing Austria

THE Osterreichischer Aero-Club has recently produced a very excellent little English air guide to Austria, in which notes are given of all the geographical details likely to be of interest to pilots. There is a map of the country giving the position of the aerodromes and plans of eighteen aerodromes are given. To anyone contemplating an air tour of that part of the world this guide should be invaluable.

Leicester's Official Opening

WHEN the Leicester municipal airport is officially opened next Saturday it will be under "control" from 9.45 a.m. onwards and will be closed to visitors by air between 10.30 and 11 a.m. and between 2.30 and 5.30 p.m. During these periods the usual red square panel with yellow diagonals will be displayed near the hangar wind indicator.

For the convenience of people competing in the Grosvenor Cup race the arrival competition will be in two sections—9.45 a.m. and 12 noon being regarded as "zero hours."

A Midland Air Race

TO be flown on Saturday, July 20, a handicap air race, open to all pilots with fifty hours' solo experience and to all machines, is being organised by the Midland Aero Club, with the co-operation of four others and of the Royal Aero Club. This race was originally mooted by *Contact*.

The 170-mile course includes Castle Bromwich, Meir (Stoke-on-Trent), Tollerton (Nottingham), Braunstone (Leicester), and Sywell (Northampton), whence the machines will return to Birmingham. Pilots must land at each of these control points and hand in their race card for a signature before taking off into wind. There will be some glorious "swish-tail" approaches and some riotously fast taxying at the control points!

A cup and cash prizes of at least £50, £20, and £10 will go to the three leaders, and entry forms can be obtained from the Midland Aero Club, Castle Bromwich.

Aviation Clubs in France

ACCORDING to M. Paul Reynaud, former French Minister of Colonies, speaking at the Sixth Annual Convention of the Federation Aeronautique de France, the number of new pilots licensed this year in France has increased to 150: the number of French touring private aircraft has grown during the past few years from 168 to more than 1,100, and the list of constituent clubs in the Federation from 46 to 141, while their membership has increased from 45,000 to 150,000.

M. Chollat Secretary General said that the Federation had spent thirteen million francs on the purchase of aircraft during the past year, while three million francs had been spent on the construction of buildings, etc. Together with taxes and many other items, he said, no less than thirty-five million francs was spent last year on private aviation.

A resolution that the present tax on aircraft, which follows the lines of the automobile tax, should be abolished, together with the hangar and landing taxes, was unanimously carried

A silhouette view taken at the Display at Hendon, which emphasises the "knuckleduster-like" design of the new Short R 24/31 flying boat. (*Flight* photograph.)

THE SHORT "KNUCKLEDUSTER"

Details Disclosed of a Monoplane Flying-Boat Which Has Provided Much Valuable Data

OFFICIALLY known as the Short R24/31, the Short "Knuckleduster" monoplane flying-boat has already been illustrated in *Flight* (February 8, 1934), but so far a detailed description has not been released. This boat is, with the exception of the small "Cockle," the first monoplane flying-boat to be built by Short Brothers at Rochester, and this fact alone makes it of particular interest. It was primarily constructed because the firm felt that very little monoplane flying-boat experience was available in this country. A boat of this nature would, we imagine, form a stepping-stone between previous boats and a really large boat with high wing loading which would necessitate the fitting of developments such as wing flaps and controllable-pitch airscrews.

From all reports the R24/31 has fully lived up to its manufacturers' hopes, and has provided them with a considerable amount of valuable data. The first thing that strikes an observer is the gull-type wing. This was used in order that the necessary water clearance could be obtained for the airscrews and to provide a rigid attachment of the wing to the hull. As the machine is a type for military purposes, and built to an Air Ministry specification, its performance and characteristics cannot, of course, easily be compared with those of civil boats, but it would seem probable that many of the lessons learnt are capable of being incorporated in future civil types.

The construction of the main plane is entirely of metal, with a spar built up in the form of a braced rectangular tubular structure. The booms of this spar consist of four high-tensile steel tubes, of which the diameter and gauge are reduced towards the wing tip.

The ribs are of duralumin tubing with duralumin corner plates.

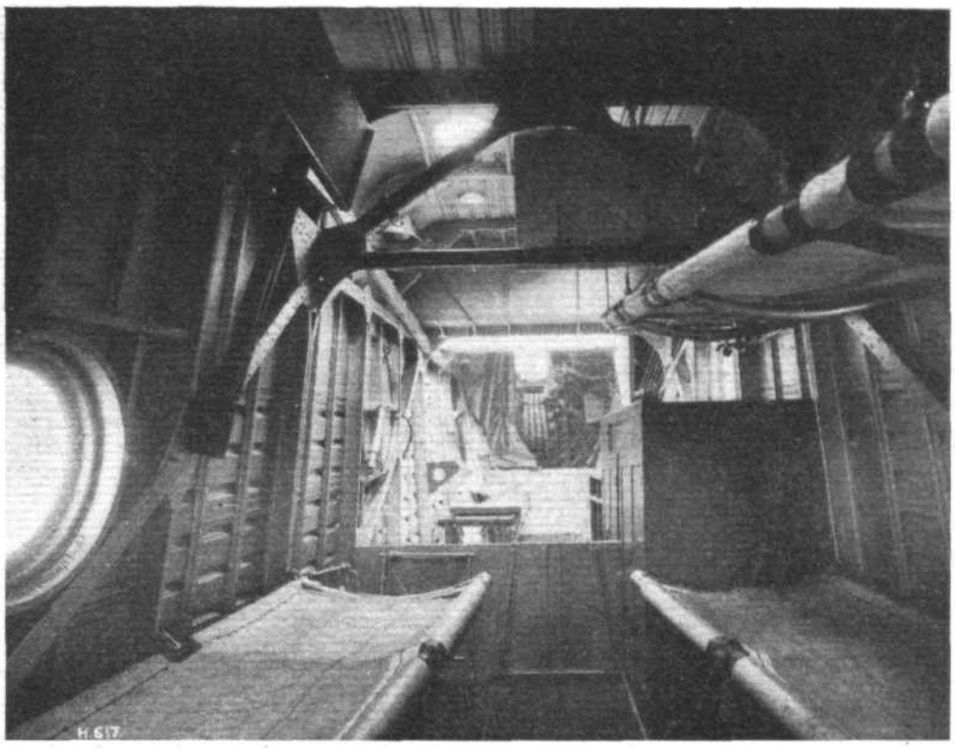
The wing is fabric-covered in the main, but the leading and trailing edges are metal-covered for a portion of the chord. The ailerons, which have sheet-metal ribs, are of the Frise type.

A braced monoplane tail supports twin rudders and fins; the spars of the tail plane are of the braced girder type; the front spar is continuous, while the rear spar terminates at the centre in a structure which houses the rear tail gun. The rudder, elevators, and fins are of metal construction similar to that of the tail plane.

Two Rolls-Royce "Goshawk" engines are mounted on the wings at the knuckles and raised slightly in order to provide adequate water clearance. The mountings are of welded steel tubing faired with detachable duralumin panels. These engines are evaporatively cooled and have condensers mounted on top of the nacelles behind them.

The fuel is carried in two main welded aluminium tanks of 178 gallons capacity each, and two tinned steel 46-gallon gravity tanks. The systems are balanced across the hull so that either engine can be fed from any tank.

The hull of the R24/31 has accommodation for a crew of five—first and second pilot, front gunner



This view of the centre portion of the "Knuckleduster" shows the braced internal structure. The bunks are for the crew.

(who is also a bomb aimer), wireless operator and engineer. In the bow is a gun cockpit with the bomb aimer's hatch and seat. In the pilot's cockpit the pilot's seat is on the port side, with a removable set of flying controls on the starboard side. Behind this is the navigator's compartment with a chart table and compass ports for taking bearings, and two officer's bunks. Then there is the wireless and engineer's compartment, which comes between the spar frames, the wireless operator being seated on the port side and the engineer on the starboard side. The crew's quarters include two fixed bunks and one folding bunk, and then abaft them are washing and cooking facilities. Further aft still is the mid-gun cockpit with a bench for the engineer, a lavatory and stowages for drogues, then, finally, there is the tail gun cockpit.

Straight-sided frames are used, and the whole structure is completely braced from near the bow to the rear step. This braced structure is stressed to carry all main loads, the corrugated skin being additional to the main strength. A deep I-section centre keelson is continuous from the bow to the rear step. The side keelsons are of I-section and the intercostal stiffeners of Z-section. The bottom planing surface is longitudinally plated with flat sheets, the top and side sheeting also being plated longitudinally, but with corrugated sheets, "Alclad" being used for all plating.

Five watertight bulkheads are arranged so that the aircraft will remain afloat with any one compartment flooded. Abaft the rear step the construction is somewhat different from that before it. Eight continuous box-section members run fore and aft inside the skin, the frames being intersected by these members. Light intercostal stringers support the skin plating between the frames.

A view aft through the pilot's cockpit: Note the "tumble home" of the corrugated outer skin plating.

Twin-engined General-purpose Flying-Boat.

Power Unit.

Two Rolls-Royce "Goshawk VIII" engines.

Gear reduction	0.477-1.
Maximum power	775 b.h.p. at 3,000 r.p.m. at 5,000ft.
Rated power	720 b.h.p. at 2,600 r.p.m. at 3,000ft.
Airscrews	12ft. 3in. (*3,74 m*) dia.: two-bladed wooden.

Dimensions.

	ft.	in.	*m*
Length	63	3	(*19,28*)
Height (datum horizontal)	20	0	(*6,1*)
Span, main planes	90	0	(*27,4*)
Chord: at side of hull	16	2	(*4,93*)
at wing tip	11	2.5	(*3,42*)
Incidence: main wing	5 deg.		
inner portion	5 deg. at engine position. 1 deg. at hull side.		

	sq. ft.	m^2
Main plane area including ailerons	1,147	(*106.5*)
Area of ailerons	117	(*10,88*)

Tail Plane and Elevator.

	ft.	in.	*m*
Span, tail plane	24	9	(*7,55*)
Chord, tail plane	7	1	(*2,16*)

	sq. ft.	m^2
Area tail plane	85.7	(*7,96*)
Area elevator	58.3	(*5,41*)
Total tail plane and elevator	144	(*13,38*)

Rudders and Fins (Twin).

	sq. ft.	m^2
Fin area	32.4	(*3,01*)
Rudder area	32.3	(*3,0*)
Total area	64.7	(*6,01*)

Hull.

	ft.	in.	*m*
Length overall	61	4	(*18,67*)
Maximum beam over chine	9	3	(*2,815*)
Maximum depth	9	9	(*2,97*)

Tankage.

	gall.	*l*
Gravity petrol tanks	92	(*418*)
Main tanks	352	(*1 600*)

Weights.

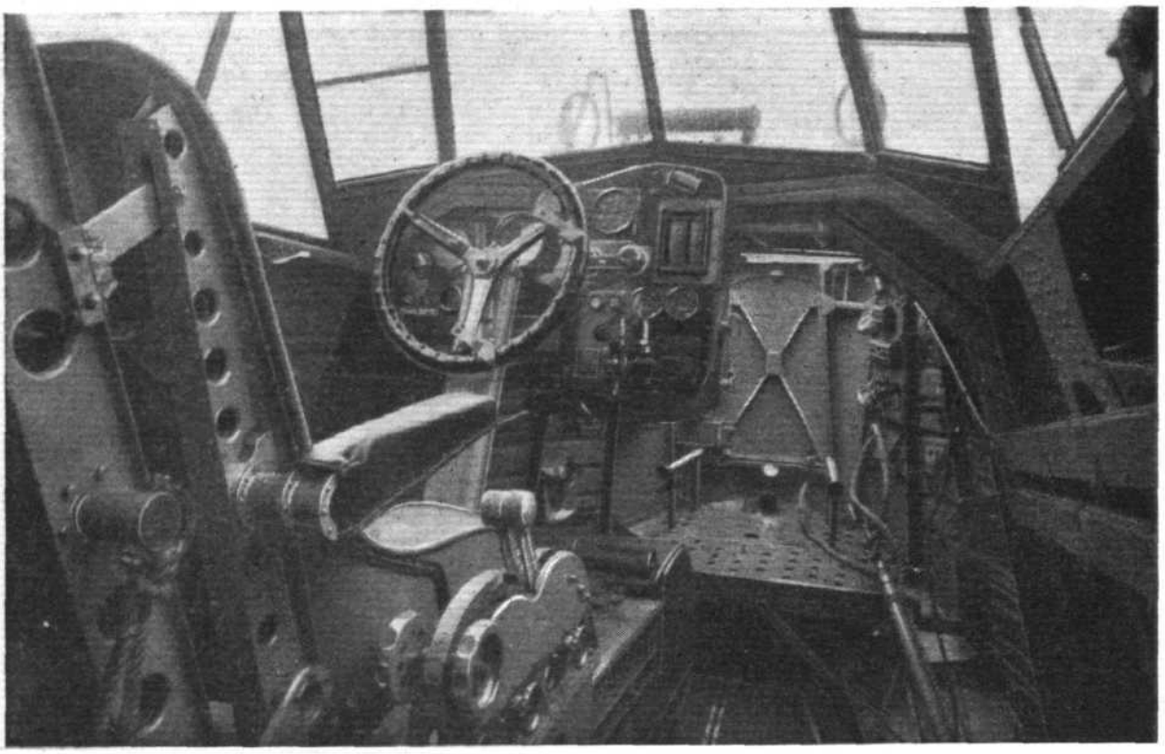
	lb.	*kg*
Weight light with water	11,720	(*5 320*)
Fuel. Petrol, 410 gall. (*1 864 l*) / Oil, 15 gall. (*68 l*)	3,295	(*1 495*)
Military load	3,485	(*1 580*)
	18,500	(*8 395*)

Loading.

Wing loading	16 lb./sq. ft. (*78,15 kg/m²*)
Power loading (rated B.H.P.)	13.3 lb./h.p. (*6,03 kg/h.p*)

Performance.

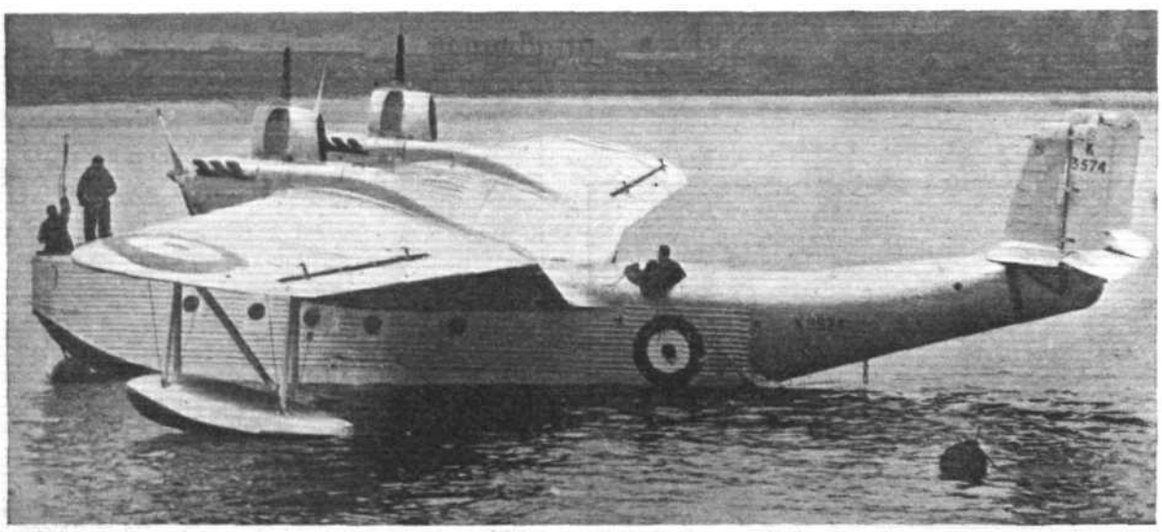
	m.p.h.	*km/hr*
Maximum speed 4,500ft. (*1 372 m*)	150	(*241,5*)
Minimum flying speed	65	(*104,5*)
Rate of climb. S.L.	800 ft./min. (*4,07 m/sec*)	
Service ceiling	14,600 ft. (*4,450 m*)	
Absolute ceiling	16,500ft. (*5,040 m*)	
Time to take-off	17 sec.	
Range at economical cruising speed	850 sea miles (*1 575 km*)	



Looking forward into the pilot's cockpit : The pilot's seat can be seen on the port side, with the throttle levers and mixture controls by his right hand.

Tie-rods and chains are used for the controls except in the wing, where flexible cables are used for the ailerons. The tail-trimming gear is operated by a hand wheel from the pilot's cockpit. The dual flying controls are constructed as a separate and complete unit which is not normally carried in the machine. A three-axes automatic control is installed, with the units housed under the pilot's seat, the drive being an air compressor mounted on the top of the hull behind the transparent hood which is built over the pilot's cockpit.

The armament consists of three Lewis guns fitted at the bow, mid, and tail cockpits. Wind shields are provided for both the mid and tail cockpits. The bomb load is two 500 lb. or four 240 lb. bombs, four light series bombs and four reconnaissance flares. Provision is also made for transporting one 18 in. torpedo under the starboard wing root against the hull side.



The R.24/31 on the water at Rochester. The condensers of the evaporatively cooled engines are prominent.

THE BELLANCA-SPEKE PROPOSALS

LIVERPOOL CITY COUNCIL was due to debate yesterday the recommendation of the Finance Committee to sell 11.3 acres of the Speke estate on a 999 years' lease at a "peppercorn" (nominal) rent to the British International Aircraft Distributing Company, Ltd., at a price of £400 per acre, for the purpose of an aircraft factory.

The Corporation undertakes to use its best endeavours to remove the allotment holders on part of the land and to give possession of the allotment land as soon as possible and of the other land on completion; and also to grant the use of the aerodrome for testing machines built at the factory.

On its part, the aircraft company undertakes to build an aircraft factory on the land at a cost of not less than £65,000 within twelve months from the date of the contract; and to make all other necessary arrangements with the Government or other bodies to enable the business to be carried on.

The British International Aircraft Distributing Company, Ltd., was registered on May 17 as a "private" company. The nominal capital is £2,000 in 1,000 redeemable 6 per cent. cumulative preference shares of £1 each and 4,000 ordinary shares of 5s. each. The directors are Mr. Howard Kronick and Mr. Kenneth E. Caine, and the registered office is at 115, High Holborn, London, W.C.1.

HERE AND THERE

Marriage of Mr. F. Sigrist

ON Wednesday of last week, at St. Mark's Church, North Audley Street, London, a marriage took place between Mr. Frederick Sigrist, M.B.E., and Mrs. Beatrice Macknight, widow of Mr. W. A. Macknight.

Mr. Sigrist is, of course, joint managing director of Hawker Aircraft, Ltd., and his many friends in the industry will join us in tendering him heartiest congratulations.

An Important Aircraft Merger

HAWKER-SIDDELEY AIRCRAFT CO., LTD., is the title of a new company which has been formed to acquire the whole of the ordinary share capital of the Armstrong Siddeley Development Co., Ltd., and 50 per cent. of the total issued ordinary share capital of Hawker Aircraft, Ltd. The former consists of 419,751 shares of £1, of which 3,008 are fully paid and 416,743 paid up to the extent of 18s. 6d. per share.

The Armstrong Siddeley Development Co. controls Sir W. G. Armstrong Whitworth Aircraft, Ltd., A. V. Roe and Co., Ltd., Armstrong Siddeley Motors, Ltd., Stone Leigh Motors, Ltd., Burlington Carriage Co., Ltd., Air Service Training, Ltd., and holds substantial interests in Self-Changing Gear Trading Co., Ltd., and High Duty Alloys. Hawker Aircraft control the Gloster Aircraft Co. This merger, therefore, will be one of the biggest in aviation.

The board of the new company will consist of Mr. T. O. M. Sopwith, as chairman, Mr. Philip E. Hill, Mr. F. Sigrist and Mr. F. S. Spriggs.

The Late B. J. O'C. Hanstock

A MOST regrettable accident occurred at Redhill Aerodrome recently when Mr. B. J. O'C. Hanstock was killed while landing in a D.H. "Dragon Rapide."

It appears that Mr. Hanstock was making a side-slip landing through a gap between some trees on the edge of the aerodrome and that these trees caused him to make an error of judgment, so that he slipped his starboard wings right into the ground. The nose of the machine was severely crushed when he turned over, and caused fatal injuries to Mr. Hanstock. There were no passengers in the machine at the time, although had there been it is probable that they would not have been seriously injured as the fuselage was comparatively unharmed.

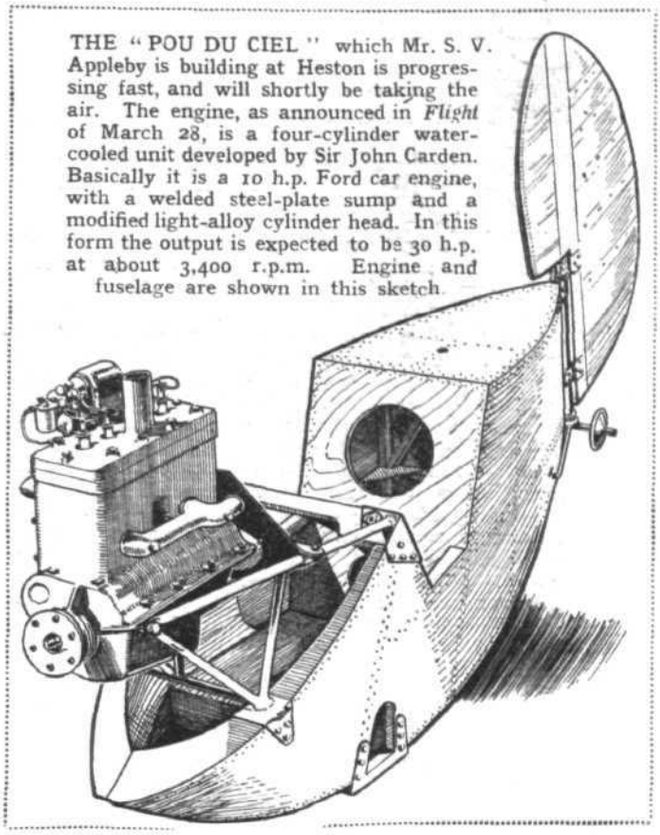
Mr. Hanstock, who served in the R.A.F. from 1921 to 1925, was manager of the aviation department of the Anglo-American Oil Co. in Great Britain from 1929.

"Jimmy," as he was known to his friends, was a well-known figure at all flying meetings, and his death will be mourned by very many people connected with flying in this country.

R.Ae.C. News and Notes

KING'S CUP RACE.—Intending competitors are informed that entries close on July 15 at 5 p.m. Regulations and entry forms can be obtained from the Royal Aero Club, 119, Piccadilly, London W.1.

Air Touring Abroad.—Members of the R.Ae.C. are reminded that arrangements have been completed whereby they are exempt from landing and take-off fees and are given free garage for their aircraft for a period of forty-eight hours when visiting the following countries as air tourists: Austria, Germany, Greece, Hungary, Italy, Japan, Poland, Roumania, Sweden.



THE "POU DU CIEL" which Mr. S. V. Appleby is building at Heston is progressing fast, and will shortly be taking the air. The engine, as announced in *Flight* of March 28, is a four-cylinder water-cooled unit developed by Sir John Carden. Basically it is a 10 h.p. Ford car engine, with a welded steel-plate sump and a modified light-alloy cylinder head. In this form the output is expected to be 30 h.p. at about 3,400 r.p.m. Engine and fuselage are shown in this sketch.

Negotiations are now proceeding with other European countries for similar facilities, and the holders of Identity Cards will be duly notified as soon as these come into the scheme.

To obtain these facilities members must apply to the Club for an Identity Card, giving date and place of birth, and forward passport photographs.

Lady Membership.—It is not too generally known that ladies are eligible for membership of the R.Ae.C. Lady members are entitled to all the facilities of membership, with the exception of the use of the Club premises in Piccadilly. The air touring facilities include reduction in the fees for Carnets, provision of Identity Cards permitting free garage of aircraft for forty-eight hours, and the waiving of landing fees and take-off fees in certain European countries.

The annual subscription of lady members is £2 2s.

Week-end in Holland.—The Royal Aero Club of the Netherlands has extended, through the R.Ae.C., a limited number of invitations to British private air tourists to take part in a week-end tour of Holland from August 22 to 25. Participants will be the guests of the Royal Aero Club of the Netherlands.

Air Force List

THE July issue of the *Air Force List* has now been published. It can be purchased (price 2s. 6d.) from H.M. Stationery Office at the following addresses: Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh; 2, York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 15, Donegall Square, Belfast; or through any bookseller.

Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in the list.

July 13. Opening of Leicester Municipal Airport.
July 16-20. R.A.F. Athletics Championships, Uxbridge.
July 20. "Contact Air Race," Midland Aero Club.
July 20-21. Coupe Armand Esders, Aero Club de France.
July 26. Opening of Newcastle-upon-Tyne Municipal Airport.
July 27. London-Newcastle Race, Newcastle Aero Club.
July 27. Hanworth Club's Garden Party at Aldenham.
July 28. Private Owners' Garden Party, Ratcliffe, Leicester.
July 31. Inter-Services Athletics Championships, Uxbridge.
Aug. 10-20. Second International Austrian Alpine Flight.
Aug. 17. Round the Isle of Wight Air Race and Portsmouth Air Trophy.
Aug. 24-25. Third International Flying Meeting, Lympne.
Aug. 24—Sept. 1. National Gliding Competition, Sutton Bank.
Aug. 24-25. Cinque Ports Club. International Flying Meeting and Wakefield Cup Race.
Aug. 24-30. Raduno del Littorio, Rome. Reale Aero Club d'Italia.
Sept. 6-7. King's Cup Air Race.
Sept. 14. Cinque Ports Club. Folkestone Aero Trophy Race.
Sept. 15. Gordon Bennett Balloon Race, Warsaw.
Oct. 12-28. International Aircraft Exhibition, Milan.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —

THE WEEK AT CROYDON

International Co-operation : An Escort Escorted : Comparative Silence : Let Us Now Dig Up the Tarmac! : The "Comet" Record : The Teacup War

ALTHOUGH the details of the inauguration of British Continental Airways' services are recorded elsewhere, several interesting remarks, made at the luncheon, call for a little comment. Lt. Col. Shelmerdine explained that the necessary permission had been obtained more easily than in any other case, and commended Belgian good sense in allowing—or even in welcoming—guests by air to their own seaside resorts, where they can spend money.

This sort of thing makes good hearing. Aviation must be international or nothing, and the tendency in certain quarters up to date has been to make it as difficult as possible to fly anywhere. Foreign lines to British seaside resorts will depend much on whether City Fathers insist on visitors bathing in macintoshes and broad-brimmed hats.

A Royal Visit

T.R.H. the Duke and Duchess of York returned from Brussels during the week with Capt. Youell in the Imperial Airways' D.H.86. On landing the royal couple inspected *Heracles*, which the Duchess had not seen before.

The R.A.F. escort had lots of fun—of a sort—when "Jimmy," with his really fast machine, did a considerable spot of blind flying and emerged, alone I gather, above the clouds. All's well that ends well.

Railway people are worried about noise. They are fitting rubber tyres and silencing those porters who scream unintelligible place names at night, who jazz around with milk cans and who bang doors. Guards must not blow whistles even though trains will not start. Railway directors have evidently been travelling either in *Heracles* or a Douglas. The companies advertise the joys of dealing with your toilet on the train and of arriving fresh. There is no grime in air travel, but you can almost have a bath, if you want to, on most modern machines.

The wet-plaster-shooting season is over in the new Customs Hall, so a new sport is the vogue. Right in the busy season the Air Ministry has chopped up a huge expanse of tarmac in order to re-lay it. Result: the south-west take-off has been made very difficult, and machines have to do intricate waltzes to get away from the tarmac. Asked why it had to be done now and not in winter an official replied, "The Treasury awoke recently with a start and sanctioned the expenditure, so the money must be spent immediately." Once the cash is drawn, you see, and lying about, it might melt away on the odd beer here and there. It is scarcely necessary to add that commercial companies were not consulted. As for the dust storms that the business has caused—who cares? The choking billows disperse before they reach Whitehall.

Sartorially, the Royal Air Force is copying civil aviation companies who, for a long time, have been wearing pale blue collars and shirts, so as not to be mistaken for naval people by any mischance. The R.A.F. is trying this idea out experimentally. Why experimentally? Will damp recruits, when addressed sharply by wicked N.C.O.s, go permanently pale blue wherever the shirt touches?

Capt Broad took the second "Comet" for delivery to the French Government, from Croydon to Le Bourget in fifty minutes. He flew at 5,000ft. above clouds, and without wireless. Whilst Le Bourget was decoding Croydon's wireless departure message Hubert S. popped through a hole in the cloud and landed. The only foreign bits about the "Comet" were the registration letters and the airscrews—both French. But, as they are saying in Paris, where would he have been without his props?

Luxury Touring

Lord Beaverbrook, accompanied by Lord and Lady Weymouth and party, left Croydon on Monday, July 8, in a privately hired K.L.M. Douglas. An extensive tour of Europe is planned, and, afterwards, it is said, a tour of the British Isles will be made. Lord Beaverbrook is picking up Col. Patterson, the New York newspaper magnate, in Paris. Cdr. J. B. Scholte, who was co-pilot with Cdr. Geysendorffer in the extensive tours by air made by the late L. van Lear Black, is the pilot on this tour. Olley Air Service, Ltd., supplied a D.H. "Rapide" to carry some of the party, and Capt. "Bill" Ledlie was pilot. The tour includes Geneva, Rome, Venice, Naples, Zagreb, Budapest, Prague, and Zurich.

The battle which officials are waging with us over a cup of tea in the buffet has been tinged with just the right touch of ridicule. Senior pilots debarred from entering the place have been seen buying cups of tea in the hotel and carrying them in solemn procession for consumption in the buffet!

A. VIATOR.

Linking London's Airports

COMMERCIAL AIR HIRE—or Inner Circle Air Lines—now have two beautifully finished Monospar S.T.4 machines in action on the inter-airport service. When the third is delivered it will be time to start thinking about an Outer Circle.

The new machines, which have Pobjoy "Niagara II" engines, are equipped with landing headlights inside the noses, with a dipping lever on the dashboard, and are finished in black and red, with red upholstery. Normally arranged to carry three passengers, a pilot, and ample luggage, there is also a fourth passenger seat facing rearwards, so that this passenger's legs find comfortable room between the two rear seats. This extra seat tips up out of the way when not in use.

In addition to Messrs. Pugh and Noddings, Mr. J. L. M. Davys, who will be remembered for his aerobatic work at Hendon in past years, also flies the Inner Circle machines. The first two, of course, fly regularly to Paris with the early morning newspapers.

The Avro 642, incidentally, is averaging 136 m.p.h. on this job and is to be fitted with meteorological equipment previously carried by the drowned "Cruiser." The pilots like the Avro immensely, yet later on it is to be equipped with a P.B. Automatic Pilot—presumably so that Mr. Pugh need not get behind with his crossword puzzles. Another 642 will, one hears, eventually be purchased.

Reduced Imperial Fares

SPECIAL "off-season" fares are to be introduced next week on Imperial Airways' Australia route.

Between July 16 and September 7, on the outward journey, and between July 17 and September 11, on the inward journey, passengers will be able to travel, for instance, between here and Bangkok or Singapore for £140—as against the standard fare of £156—and over the whole route for £175—as compared with £195. Over several other sections similar reductions have been made and return tickets can be obtained with comparable reductions so long as the journey is completed within the "off-season" period.

An Airport Time-table

PROBABLY for the first time a municipal authority has issued an airway time-table. Published by the Hull Development Committee, this time-table gives details of all the air services touching Hedon, of Continental air and rail connections and of freight and other facilities.

Commercial Aviation

TO THE BELGIAN COAST

British Continental Airways Start Services to Ostend, Le Zoute and Brussels : An Impression of the Inaugural Trip

IN the midst of all the international misunderstandings and jealousies, it is pleasant to be able to record yet another case of friendly co-operation. Although both Sabena and an English operating company already run services between London, Ostend and Brussels, British Continental Airways inaugurated, on Tuesday of last week, fast new services to Ostend, Le Zoute (Knocke), and Brussels.

As Lt. Col. Shelmerdine was careful to explain, such concessions by a foreign Government cannot be considered as favours, for more services mean more passengers carrying good English money to be spent abroad. He hoped that one day Belgian passengers might be brought to spend their money in Brighton, and spoke of the possibility of co-operation on the Congo mail and future passenger service.

Introducing the new services at the luncheon held in the Airport Hotel at Croydon, Sir Percy Mackinnon explained that this holiday service was merely a start and that the demand for this and other services would undoubtedly grow very rapidly.

Replying for the Belgian Ambassador, General A. Nyssens, the Military Attaché, spoke of the friendly relations between the two countries and reminded his listeners that not since the time of Julius Cæsar—when a Belgian legion fought against the Scots!—had there been war between them. Le Zoute, he said, was almost a British colony.

After the luncheon, Mr. J. K. Morton, replete with the hirsute protection which he evolved while in foreign parts last year, took the first D.H. "Rapide" on the Ostend run, carrying the directors of the company and a member of the staff of *Flight*. Actually, British Continental Airways have two six-passenger "Rapides" in action, and a third is to be delivered in August. Meanwhile, they also have the use of Mr. Graham Mackinnon's "Dragon." All machines carry a radio operator to comply with Belgian regulations.

For the moment, as already recorded, three week-day return services will be run to Ostend and Le Zoute, with one service to and from Ostend on Sunday. Another service is being run to Brussels on Saturday and Sunday, returning on Monday morning. The London terminal point is the Goring Hotel, Grosvenor Gardens, S.W.1, whence cars leave an hour before the service departures from Croydon.

Leaving Croydon on the inaugural trip, the coast was reached south of Ramsgate in exactly half an hour, and a landing was made at Brussels at the end of the second half-hour. The "Rapide" was, therefore, a quarter of an hour ahead of the schedule time for the run—and this despite a slight head wind. It would seem that the advertised "Ostend in seventy-five minutes" should be well within the capabilities of the regular service. The continuation to Le Zoute was made after a short stay for tea at Ostend. The return journey was uneventful, as we are now entitled to expect commercial air travel to be.

The bookings at Ostend are in the hands of Handel and Scheepvaart, 42, Rue Euphrosine-Beernaert, and an office at Le Zoute has been opened at Rue de L'Estran. There would seem to be a very good opening both for day trip and week-end visitor traffic to the Belgian coast. Every week-end many hundreds of people from England make the journey by boat, and undoubtedly a large proportion of those would willingly save time by making the air journey. At the present time the Belgian Government will not allow more than three trips a day and only two trips at the week-end to Brussels. We imagine, however, that a greater number will be allowed as soon as it is seen to what extent the services bring visitors to that country.

At Brighton

IN *Flight* of June 20 details of the Brighton, Hove and Worthing airport plans were given. The councils have now finally decided that Olley Air Service, Ltd., shall be appointed to manage the airport for a term of five years. This company will make air excursion trips a feature, and will also be operating an air service, though it is too early to give fuller details.

The flying school and club, as well as the workshops, will be run by Brooklands Aviation for a similar term of years and arrangements are being made to run a first-class restaurant in order to encourage visitors.

The new airport is now licensed and a large hangar is already available. The terminal building will be ready before the end of next month and the official opening is expected to take place in or about the third week in September.

The Channel Tragedy

IN these days of multi-engined machines it is not often that a transport forced landing—other than for weather—is reported, though very occasionally a complete fuel system fails. All multi-engined machines should be so designed as to have entirely separate fuel systems for each motor.

Last week a Westland "Wessex," belonging to Cobham Air Routes and being flown by Mr. W. Ogden from Guernsey to Bournemouth with a single passenger, reported the failure of the starboard engine and eventually put down on the sea some three miles from the Needles. The passenger, Mr. C. F. H Grainger, was picked up two hours later by the *Stanmore*, a vessel without radio, but Mr. Ogden apparently went down with the "Wessex."

Although the Cobham "Wessexes" are by no means new, and were, in fact, originally owned by Sabena, good maintenance and replacements for the yearly C. of A. generally mean that an old machine is as good as a new one. It has yet to be discovered why, on the evidence of the survivor, this particular "Wessex" failed to remain in the air on the two useful engines. One or other may, of course, have failed without the passenger's knowledge. Mr. Ogden appeared to know of the chance of a forced descent because he told his passenger to use one of the lifebelts always carried.

Few people realise the difficulty of the decision which has sometimes to be made by a pilot in such circumstances. He can either carry on down wind in the hope of reaching land and with the knowledge that he may not be in a position to turn into wind at the end. He may turn at once while he still has height to spare and either carry on, perhaps away from land, in the hope of seeing a vessel, or put down at once to trust in a safe "landing" and in the ability of his machine to float for a reasonable length of time.

Operators have trouble enough with indifferent weather and should, in 1935, be able to rule out all possibility that a mechanical defect will bring a machine down.

Ancient and Modern

SWEDISH AB. Aerotransport is organising a regular flying service, with guides, to the castles of Gripsholm and Skokloster. Visitors to Stockholm will be able to see, in the shortest possible time, two relics of Sweden's past.

Extending the Mail Service

AS already forecasted in *Flight*, two air mail despatches are now made to South America—on Wednesday and Saturday. Letters despatched on Wednesday will be forwarded via Germany and those despatched on Saturday via France. The latest times of posting in the air mail box at the Head Post Office, London, E.C.1, will be 8 p.m. on Wednesday and 4.30 p.m. on Saturday.

Last week, incidentally, a Dornier "Wal" was forced down by engine trouble in mid-ocean while on her way eastwards across the South Atlantic. Her operator informed the *Schwaberland* stationed off Fernando de Noronha, of the trouble, but the "Wal" carried on for five hours with one engine and the *Westfalen* hurried from her position off Bathurst.

The *Graf Zeppelin*, bound for South America, was also notified and stood by until the *Westfalen* arrived on the scene and transferred the mails to a reserve flying boat. It was hoped, by night flying, to make up much of the seventeen hours lost while the first Dornier was disabled.

An air mail service will also be run to Gambia on each Wednesday instead of on alternative Saturdays as hitherto; the latest time of posting for the new weekly service will be the same as that for the Wednesday despatch to South America.

Commercial Aviation

A STORM IN A TEACUP

Officialdom versus Commerce at Croydon Airport : An Operator's Opinions

PEOPLE at Croydon have been very much amused—when not annoyed—by an attempt to show the iron hand within the velvet glove. There is, in fact, the most glorious battle in progress concerning the actual spot where tenants and others may consume cups of tea and coffee.

The question of whether one may or may not use the main hall buffet if one is an air line pilot, manager, or office boy appears to the outsider, perhaps, as a trivial one, but the complications are immense and the possibilities of future terroristic methods are unlimited.

"We," writes a Croydon habitué, "are busy commercial people, tenants of the Air Ministry, and paying, in some cases, £3,000 or more for rent and hangarage. As such we expect courteous and reasonable treatment and no unnecessary interference by our landlords.

"It is true that in the buffet hang a number of notices to the effect that the place is for passengers and visitors only, and this is explained by ancient history. When a licence for alcoholic liquors was demanded, certain magistrates, true to type, granted it on condition that pilots and air line officials were not to drink in the buffet.

"But even the various people who made this ridiculous rule were not so obtuse as those Air Ministry officials who now seek to persuade us that the alcoholic licence of the buffet is imperilled if an office boy drinks tea therein. Suddenly, however, someone of, or from, Whitehall issued an edict to the effect that the buffet was to be shut henceforth to everyone save passengers and visitors.

"It would be unfair to expect those who run the Airport—but not the commercial people in it!—to comprehend the circumstances. These are quite simply that traffic staffs have no time to seek the hotel and await service there during rush hours and that many pilots have but a scant half hour on the ground after arrival and before their next departure. Quite naturally, too, it has not been considered that this tremendous reform comes five years too late. There was a time when passengers needed such a place, but to-day reconstructions have just been completed which prevent all incoming passengers from entering the main hall.

"There remains, then, the visitors, who must not be contaminated by the presence of senior pilots, Customs officers, managers, and the like. Somebody in the Old Testament set out to chastise people with scorpions. Now mark how this futile attempt to oppress a bunch of tough commercial gentry has ended in a feeble beating of the air with wet earth worms.

"Managers of firms said that the thing was ludicrous, and an exception was made in their case. Next came Swissair, pointing out that pilots of that company had no time to go elsewhere. Exception number two was made and, to prevent international complications, French, German, Dutch, and Belgian pilots and crews could no longer be excluded. H.M. Customs and Excise, Home Office officials, and others promptly protested against undue favouritism. Not unnaturally, if Swiss pilots may sip coffee in the buffet, traffic staffs, with the documentary and groundwork of such services, also need the same facility.

"At the moment the situation is indeed comic. Authority has succeeded in closing the main hall buffet to none but a few hard-working juniors, to the whole of the Imperial Airways pilots, and to the officers of H.M. Customs and Excise. Panic, however, is appearing, for there are rumours of dithering in the dens of officialdom. The permission to the few is now to be withdrawn, though if the original excuse holds good and the use of the place by air line pilots invalidates the licence, it should obviously never have been granted.

"The really amusing part of the whole affair is that nobody can obtain a plain answer to the question: Does tea drinking by air line employees imperil the alcoholic licence of the buffet? If it were clearly stated that this was the case the logical commercial community would support the Air Ministry in closing the buffet to air line employees until such time as the licensing magistrates were approached in the matter."

For the Prague-Moscow Service

TWO Airspeed "Envoys" will be delivered this month to the Ceskoslovenske Statni Aerolinie for the service between Prague and Moscow which is to be opened on August 1. The 1,200 miles will be done in three stages and in one day, and the "Envoys," carrying a wide margin of fuel, are equipped to carry either five passengers or four with a radio operator.

The engines are Walter "Castors" of 260-340 h.p., and with these the cruising and maximum speeds, at 4,000ft., are 167 m.p.h. and 190 m.p.h. respectively.

A Big Survey Job

IN last week's issue *Flight* gave, under this heading, brief details of the Ordnance Survey contract. Due partly to the fact that we received separate statements from both Aerofilms and H. Hemming and Partners, an error was made in the last sentence of the paragraph.

The contract was actually awarded to Aerofilms, Ltd. and not to Hemming and Partners, who did not submit a tender since the two companies have just entered into an agreement whereby the former operate for the latter in this country, leaving H. Hemming and Partners free to concentrate on their overseas work.

Walsall Aerodrome Opened

WALSALL'S municipal aerodrome was formally opened last Saturday by Sir William J. Talbot, J.P. The occasion was made one of some considerable aeronautical importance in the neighbourhood and about fifty visiting aircraft attended the function Amongst the machines which were demonstrated in the course of an interesting flying programme were an Avro "Cadet," a Miles "Hawk Major," a B.A. "Eagle," a Short "Scion," a Hawker "Tomtit" (Wolseley engine), a Monospar S.T.25 and a "Drone."

The aerodrome is some seventy acres in extent and is situated only two miles from Walsall and nine miles from Birmingham and Wolverhampton, and therefore serves the Midlands very well indeed. After the demonstrations and throughout the afternoon joy riding was carried on by Miss Pauline Gower, Air Travel, Ltd., and Crilly Airways.

Gatwick is Closed

SINCE last Saturday and until further notice, Gatwick aerodrome has been closed to air traffic. During the period a red square panel, with superimposed yellow diagonal strips, will be displayed. When, finally, this prospective alternative airport is opened, it should have one of the most up-to-date traffic systems in the world and a surface that is second to none. Meanwhile, Redhill aerodrome is outside the controlled zone.

Traffic at Heston . . .

THE growth of Heston as a terminal airport is illustrated by the fact that in June, 1935, 47 per cent. more passengers passed through on regular air lines than in the same month last year. The total number handled in June, 1935, was 2,357—an average of seventy-eight a day. Jersey Airways carried 991 passengers on the London-Jersey route in June and 3,017 since the beginning of the year. In the same month Spartan Airlines carried 643 passengers, which is more than double their figure for May. P.S.I.O.W.A. and United Airways have nearly doubled their bookings since last month.

. . . and at Speke

DURING the months of March, April and May, 1,878 fare-paying passengers arrived at or departed from Liverpool's Speke airport. This figure compares favourably with the 1,275 for the corresponding months of last year.

During the same period the gross income totalled £1,535, which suggests that Speke may be almost, if not quite, paying for itself. Actually some twenty-five air line machines pass through the airport every day.

Alderney's Aerodrome

EARLIER this year *Flight* explained that Jersey Airways had purchased land on the island of Alderney and were laying out an aerodrome there. It is now learnt that the Jersey machines will be calling there, on request, at the end of this month.

The aerodrome is actually on the Blaye, a headland plateau near Telegraph Bay, and, consequently, has very clear approaches. A large hotel is also to be built.

PLYWOOD in PRACTICE

The Use of Three-ply Abroad: In this Special Article, Mr. J. H. W. van der Muelen, of the K.L.M. Technical Staff, Discusses the Durability of the Plywood Surfaces of the Company's Fokkers

The famous K.L.M. Fokker F.18, *Snip*, the wing of which is entirely surfaced with Bakelite-glued three-ply.

IN view of the renewal of interest taken in the use of plywood for aircraft construction, it may be helpful to make a brief study of the methods of wing-covering used in a number of the Fokker machines at present in the service of the K.L.M. and K.N.I.L.M. These companies still have in service several machines built between eight and ten years ago, each with over 5,000 flying hours to their credit, and it is a remarkable fact that all have the original wooden wings and wing coverings, consisting of thin three-ply nailed and glued to the ribs.

Normally, these machines fly about 1,250 to 1,500 hours every year, and they are taken into the workshops for routine overhaul after some 2,000 to 2,500 hours, and even then it is not found necessary to renew either the wing or the fuselage covering.

Naturally, repairs have been carried out from time to time as a result of exterior damage, e.g., by step ladders, or striking birds in the air; but actual renewal has been necessary only in very few places—those in which the three-ply has come unstuck, or the varnish and finish broken away, allowing water to penetrate to the inside of the wing.

Practical experience with about thirty-five Fokker machines in daily service both in Europe and in the tropics has shown that trouble can almost always be avoided if it is possible to keep moisture out of the wing, though it is true that sharp sand, hail, and strong sunlight also tend to damage the finish.

The Wood Used

The Fokker wings are covered with special three-ply made in various thicknesses, and the wood is birch, glued with casein. Selection and testing are done very carefully, inspection of a plywood panel in a very strong light being used to detect defects in the interior layer.

Several of the newer Fokkers are partly covered with a new type of birch three-ply glued with Bakelite. Made in thicknesses of 0.6 and 0.8 mm., it is especially suitable for tropical conditions, since it is not in any way affected by water. It is a little more brittle than normal plywood, and, perhaps, not so suitable for very sharp corners on leading edges of thin wing sections; in order to obtain experience with this material, it is at present being used for the underside of the wing behind the rear spar on some of the later Fokker types.

The K.L.M. Fokker F.18 *Snip*, of Atlantic-flight fame, and now in regular use in the West Indies, has a wing completely covered with Bakelite three-ply. This machine has been in service nearly 2½ years, and has already flown over 2,500 hours, including fourteen return trips between Amsterdam and Batavia. Before the West Indies flight the plywood wing was inspected very carefully, but no repair work was found necessary; all that was done was to spray a new coat of aluminium paint on the upper surface and the leading edge.

As regards the most suitable wing colours, the K.L.M.'s experience has shown that aluminium on the upper surfaces is almost essential, and forms a very good protection against tropical sunlight. As a rule we do not employ aluminium paint for the under surface of the wing; a transparent finish is used instead, since this makes it easy to detect any cracks or water leakages which may develop. Sometimes it is very difficult to understand how water has found its way in; suction seems to play a big part, especially near the trailing edge, in corners near the ailerons, and sometimes near control cable leads, inspection doors, etc.

Glue Deterioration

Signs of deterioration by water must not be confused with another phenomenon, caused by glue. Glue patches left in the interior of the wing become visible right through the three-ply after the passing of six months or so; the glue seems to deteriorate and affects the lacquer on the outer side of the plywood, showing a white or discoloured patch of the same outline as the glued patch on the inside.

The problem of wing maintenance is not only a question of inspection and applying coats of new varnish or cellulose paint, but also of removing, if necessary, old coats without damaging the three-ply surface. In practice, difficulties sometimes occur because people do not appreciate that oil lacquer and cellulose finish cannot be applied over each other, and in trying to carry out a temporary repair they often make things much worse.

To give additional strength to the three-ply covering and to provide a surface which takes dope or varnish better, we have experimented very successfully with the glueing-on of very thin muslin, especially on the leading edges of older wings, and in the form of long strips over the ribs and over the seams of adjoining panels. If small cracks have appeared in the plywood, but the panel is not sufficiently faulty to warrant replacement, we often apply stronger strips of doped fabric with their sides cut in zig-zags, of the kind used to cover the stitches on fabric-surfaced fuselages.

There are several small "dodges" for obtaining the best results in glueing-on linen strips. If, for example, a strip has to be laid over a seam between two panels, special

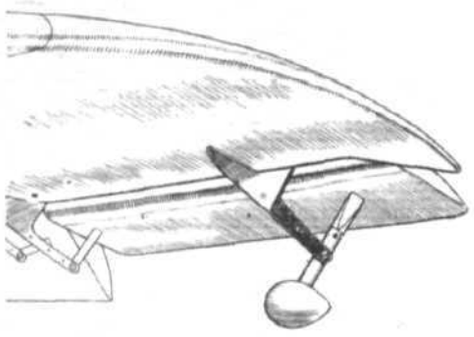
care has to be taken that no air space remains under the strip at the corners of the panels; if this is not done, water will enter and soak its way over the entire sheet, doing considerable damage. Another snag is that the strips contract in drying and exert such a strong pull that they cause cracking of the outer layer of the three-ply.

A doping scheme for wooden wings that has given satisfactory results consists of one coat of red dope applied by brush, another applied by spray, one coat of cellulose 100 per cent. aluminium, and a fourth coat consisting of 70 per cent. aluminium and 30 per cent. transparent. For wings covered with Bakelite three-ply, two coats of aluminium are found sufficient.

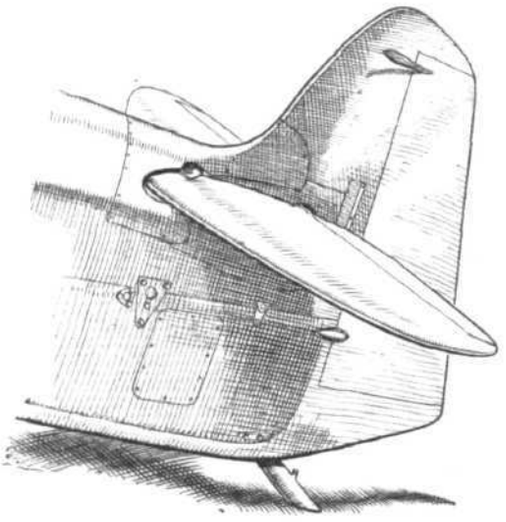
For the underside of wings K.L.M. use Titanine Lumilac S.S.L., or a special lacquer of Dutch origin. For Bakelite wings like those of *Snip*, the underside is sprayed with aluminium, since, as already mentioned, water can do less harm to this type of plywood.

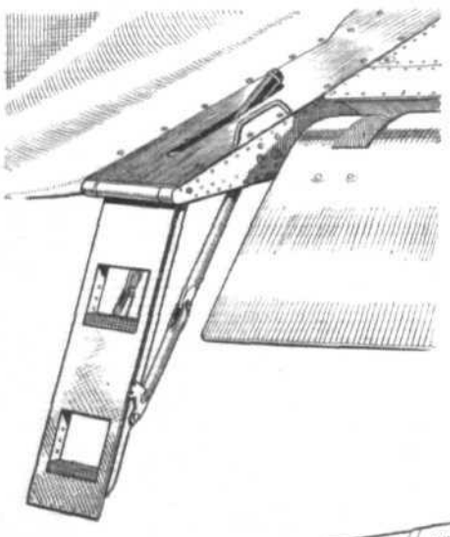
Only brass nails are employed in the wings, and they are coated with resin to give them a better grip on the wood. Naturally, the glue is the important thing, but the nails play their part while the glue is setting.

SEEN at the S.B.A.C. DISPLAY



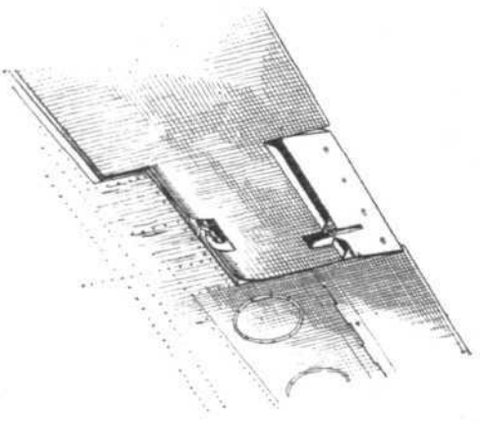
(Left) One of the "drooping" ailerons on the Parnall "Heck." (Right) The modified *empernage* on the Percival "Mew Gull."

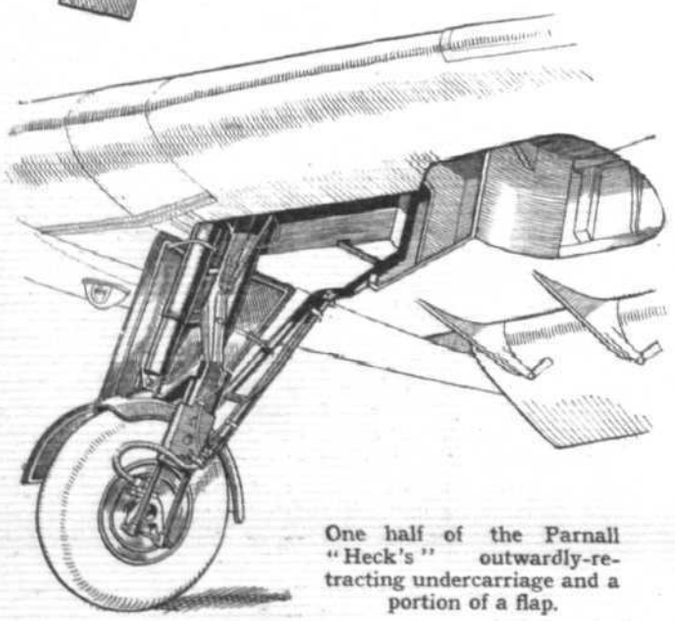




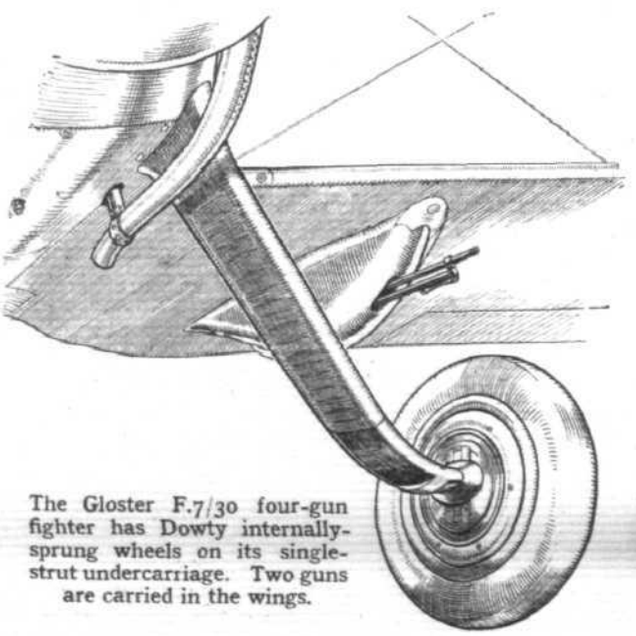
(Left) The footstep on the Handley-Page G.P. monoplane folds upwards when not in use.

(Right) An aileron "tab" on the Bristol bomber transport.





One half of the Parnall "Heck's" outwardly-retracting undercarriage and a portion of a flap.



The Gloster F.7/30 four-gun fighter has Dowty internally-sprung wheels on its single-strut undercarriage. Two guns are carried in the wings.

MODELS

The Northern Heights Club's Great Day : A Bantam "Bulldog"

A Crowded Day

A VISIT to the Northern Heights Model Flying Club's Gala Day would have provided a real surprise to anyone who did not realise how great is the interest now being displayed in model aeronautics in this country.

In brilliant sunshine some 400 enthusiasts, including fourteen clubs, congregated at Heathrow Aerodrome, Great West Road. One had come all the way from Scotland and another from Newcastle.

Proceedings opened with a *concours d'elegance*, divided into four classes. The first attracted eight petrol-driven aircraft, all of them excellent examples of workmanship and design. The first prize was won by Messrs. A. and A. M. Willis (T.M.A.C.) with a high-wing monoplane, while second place was gained by Mr. E. Ross (Northern Heights M.F.C.), with an amphibian type rather resembling a single-engined Saro "Cutty Sark."

Only two entries were received for Class B (non-flying scale models), but as both were good examples of workmanship both received awards, first prize being won by Mr. J. Webb (N.H.M.F.C.), who entered a D.H. "Comet" but to a scale of 1-64in., and which obtained 75/100 marks.

Some fifteen entries were received for Class C (flying models of any type other than petrol driven), and Mr. Allman (Leamington and Warwick Club) took first place among a number of good entries with the model which he is entering for the 1935 Wakefield Trophy, gaining 68/80 marks. Mr. F. A. Lowe (Hawker "Fury") was second with 66/80 marks.

In Section D (juniors) Mr. L. S. Wigdor's Hawker "High Speed Fury" (illustrated in *Flight* of June 13) took first place with 79/100 marks.

An interested crowd round Mr. Bishop's fine petrol-driven Autogiro model at the N.H.M.F.C. meeting. (*Flight* photograph.)

The Duration-hunters

From a numerical point of view the duration contest was the most popular—why, nobody seems to know. Year after year aeromodellists enter for the duration competitions only, getting into a rut from which it appears impossible to move them. Mr. R. N. Bullock (S.M.A.E. and Blackheath M.A.C.) was first with an average duration of 166.4 sec. (three flights). In this class one model flew out of sight and was lost. In the heavyweight section Mr. C. A. Rippon (N.H.M.F.C.) made an average of 141.8 sec. with his very stable monoplane, the wing design of which is based on that of the pre-war Ettrich-Taube.

In the inter-club team contest the Blackheath M.F.C. won the Fairey Challenge Cup for the second time with a total duration of 297.8 sec. (four flights). The S.M.A.E. was a close second.

It was a common complaint to hear that various intending competitors had broken their models before the start of particular contests, and the flying scale model contest was the one to suffer most in this respect, only four entries eventually being handed in. A Comper "Swift" belonging to Mr. H. G. Lambert (Hayes and District M.A.C.) won the *Flight* Challenge Trophy, as reported last week, with flights of 11, 26 and 29 sec., a total of 66 sec. Second place went to Mr. S. Crow (Blackheath M.F.C.), flying a D.H. "Fox Moth" and obtaining a total duration of 53.3 sec.

The rules of this contest provided that all models should conform to a linear scale of 1in. to 1ft., and it was a pity that two or three otherwise eligible models were of different scales; in particular, Mr. Lowe's Hawker "Fury," built to a scale of 1½in., would surely have gained an award, quite apart from its beautiful workmanship. Another fine Hawker "Fury" was contributed by an entrant from Newcastle.

Mr. Geoffrey Smith, Director of *Flight*, then presented the prizes, and also made, on behalf of the N.H.M.F.C., a presentation to Mr. C. R. Fairey, who had placed his fine aerodrome at Heathrow at the club's disposal.

The day concluded with some instructive flights by petrol-driven models, Mr. Bishop's Autogiro (illustrated above) arousing particular interest on account both of its large size (5ft. rotor radius) and superb workmanship.

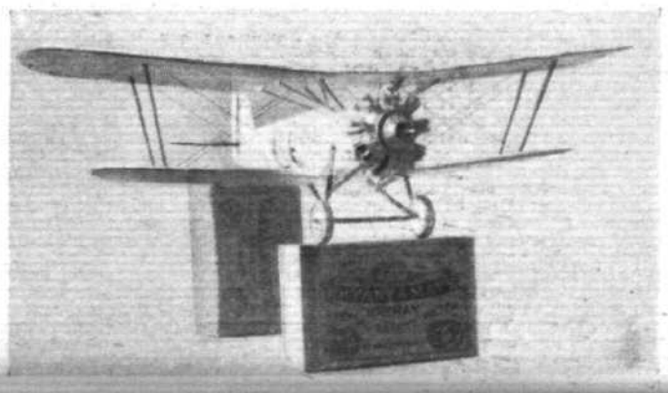
Lilliputian

THE chief point of interest about the flying scale model Bristol "Bulldog" illustrated in the snapshot below is its extremely small size; its span is only 8½in. and its length 6in. Other characteristics, says its constructor, Mr. M. Scott MacKirdy, include a geared elastic motor and a sprung undercarriage. The gearing of the engine takes place inside the engine itself, and consists of very small watch gears; the ratio is approx 3:1.

The undercarriage is sprung by the wire which constitutes the radius rod, the axle running up and down in a wire slot at the bottom of the oleo leg. The rest of the machine is constructed of balsa wood with the exception of the tail unit, which is made of stiff paper. The framework is covered with Japanese paper, one coat of clear dope, and silver water-colour paint varnished over.

Owing to its comparatively heavy wing loading and high propeller revs—though a somewhat oversized airscrew has to be used—its duration is not great, but it flies quite smoothly and can be made to do aerobatics such as loops, rolls off the top and stall turns.

The model was made from drawings obtained from the 1929 Olympia Aero show number of *Flight*.



Mr. MacKirdy's flying "Bulldog" on a matchbox for comparison.

THE INDUSTRY

An "Aerobatic" Test-bed

THERE has recently been included in the line of test hangars at the Bristol Company's engine department one of special design which allows the engine on test to be tilted either up or down to simulate climbing or diving conditions. As will be seen from the illustration, this stand is a stiff structure incorporating a mounting which holds the engine and which is capable of being revolved from the test cabin through a total arc of 180 degrees. If required, therefore, the engine under test may be made to assume vertical attitudes of climbing or diving.

All controls and feed lines, with the exception of the feed lines of the lubricating system, which is actually mounted on the trunnion arm and moves with the engine, are flexible, in order that the movement of the engine shall be as unrestricted as possible. The controls are actuated by means of Arens cables.

A Handy Size

WHAT may be termed a "pocket catalogue" of Vickers and Supermarine aircraft has been produced by Vickers (Aviation) Ltd., Broadway, Westminster, London, S.W.1. It is attractively illustrated.

A Hatfield Visit

MODERN methods of aircraft production greatly interested a party of members of the Institution of Production Engineers who visited the De Havilland works last Thursday. They were addressed by Mr. A. T. S. Groombridge (works manager), who is president of the London section of the Institution.

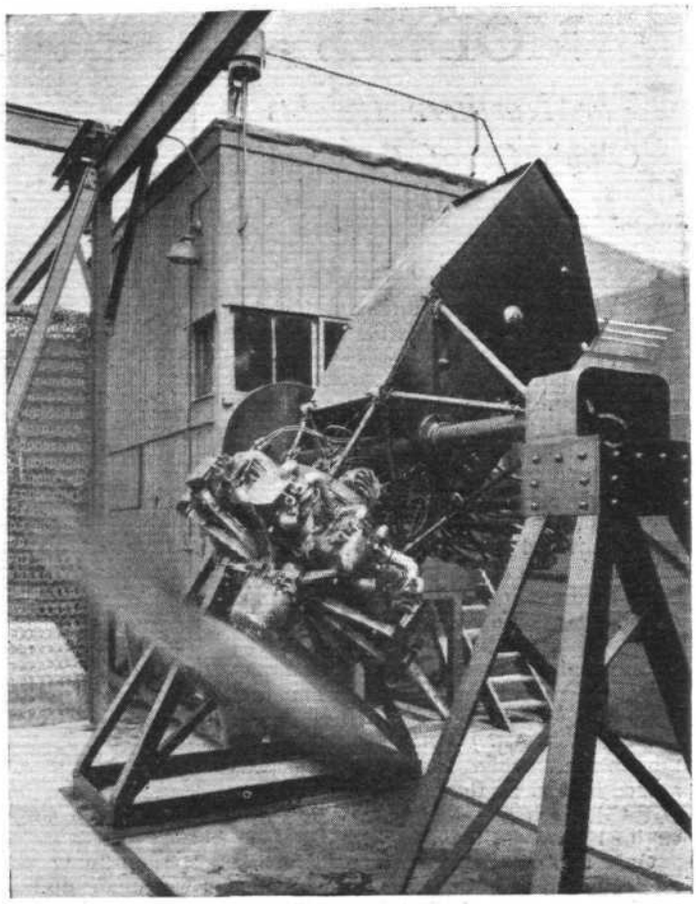
Change of Address

MR. R. H. MAYO, O.B.E., M.A., Assoc. M.Inst.F.E., F.R.Ae.S., the well-known consulting engineer and inventor of the Short-Mayo composite aircraft, has recently changed his business address, which is now 55, Pall Mall, London, S.W.1. (Telephone: Whitehall 1447).

Electron Advances

THAT extremely high machining speeds are possible on Elektron alloys is not generally recognised; cutting speeds of 4,900ft./min. are, it is said, now being achieved on large crank cases without a sign of dragging.

Great advances, too, have been made in the forging of Elektron; as an example may be quoted the forged Elektron airscrew blades produced by James Booth and Co., Ltd., for the Bristol Company, and machined in the latter's works; they are stated to have given complete satisfaction under severe testing.



A "power dive" by a "Pegasus" on the Bristol tilting test-bed, described in the adjacent column.

NEW COMPANIES

OXFORD FLYING SERVICES LTD.: Private company. Capital, £2,500 in £1 shares. Objects: To acquire the business carried on by H. V. Kimberley-Atkinson and Geo. W. Woodhouse as "Oxford Flying Services" at the Aerodrome, Chilworth, nr. Wheatley, Oxon. First directors: Harold V. Kimberley-Atkinson, Geo. W. Woodhouse. Registered office: Chilworth Aerodrome, nr. Wheatley, Oxon.

FLYING HIRE LTD.: Private company. Capital, £100 in £1 shares. Objects: To operate aerial transport of all kinds, and to manufacture and deal in aircraft, aerodrome equipment, etc. Permanent directors: Harold V. Kimberley-Atkinson, Geo. W. Woodhouse. Registered office: Chilworth Aerodrome, Chilworth, nr. Wheatley, Oxon.

AIR PULLMANS (CROYDON) LTD.: Private company. Capital, £1,000 in £1 shares. Objects: To carry on the business of transport contractors by air, etc. First directors are to be appointed by the subscribers. Secretary: David Procter. Registered office: 40, Store Street, Bedford Square, London, W.C.1.

AIRCRAFT AND AUTOS LTD.: Private company. Capital, £5,000 in £1 shares. Objects: to adopt an agreement with John E. Coxon and Alfred T. Collier, and to acquire the business of a dealer in motor vehicles and accessories for motor vehicles and aeroplanes, and insurance agent carried on by John E. Coxon. Permanent directors: John E. Coxon, Alfred T. Collier. Solicitors: Good Good and Co., Fairfax House, Fulwood Place, London, W.C.1.

AVIATION CLUBS LTD.: Private company. Capital, £1,200 in £1 shares. Objects: To establish, carry on and subsidise social, aeronautical or technical clubs, etc. First directors: A. Maurice Pilling, Eric W. Vernall. Solicitors: Joynson-Hicks and Co., Lennox House, Norfolk Street, London, W.C.2.

AEROFILMS (HOLDINGS) LIMITED. Private company. Nominal capital, £16,500 in 15,000 6 per cent. non-cumulative redeemable preference shares of £1 each and 30,000 ordinary shares of 1s. each. Objects: To adopt an agreement with A. W. Simon; to invest the capital and other moneys of the company in the acquisition of the shares of Aerofilms, Ltd., etc. First directors to be appointed by the subscribers. Registered office: Bush House, Aldwych, London, W.C.2.

POBJOY AIRMOTORS AND AIRCRAFT LTD. Public company. Nominal Capital, £250,000 in 5s. shares. Objects: To acquire the undertaking of Pobjoy Airmotors, Ltd., to adopt an agreement with the said company, A. G. L. Puckle, the liquidator thereof, and D. R. Pobjoy; to enter into three other agreements with Short Brothers (Rochester and Bedford) Ltd., D. R. Pobjoy and I. C. Maxwell respectively, and to manufacture and deal in aircraft, vessels and vehicles of all kinds. The following have consented to be directors: Douglas R. Pobjoy (managing director of Pobjoy Airmotors, Ltd.), Ian C. Maxwell (director of Pobjoy Airmotors, Ltd.), Hugh O. Short (chairman of Short Brothers Ltd.), Arthur Gouge (director, general manager and chief designer, Short Bros. Ltd.), The Earl of Brecknock (director of Pobjoy Airmotors, Ltd.). Solicitors: Lovell White and King, 5, Thavies Inn, London, E.C.1.

WOLSELEY AERO ENGINES, LTD., was registered as a "private" company on June 27, with a nominal capital of £10,000 in £1 shares. Objects: To carry on the business of manufacturers of aero engines, aircraft, parts and accessories, etc. Lord Nuffield is permanent governing director. Solicitors: A Walsh & Son, Oxford.

BAILEY AIRCRAFT, LTD. Private company. Registered June 24. Capital: £1,000 in 5s. shares. Objects: To operate air transport, aerodromes, etc. First directors to be appointed by the subscribers. Solicitors: Ingledew, Sons & Brown, 78/9, Leadenhall Street, London, E.C.

BRITISH AIRCRAFT (SALES), LTD., was registered as a "private" company on June 24 with a nominal capital of £21,000 in 20,000 5 per cent. cumulative participating preference shares of £1 each and 20,000 ordinary shares of 1s. each. Objects: To carry on the business of agents for and dealers in aircraft and components. The first directors are not named. Solicitors: Clifford-Turner & Co., 11, Old Jewry, London, E.C.2.

INCREASE OF CAPITAL

BRISTOL AEROPLANE CO., LTD.—The nominal capital has, as already recorded in *Flight*, been increased by the addition of £200,000 beyond the registered capital of £1,000,000. The additional capital is divided into 152,000 5 per cent. irredeemable cumulative preference shares of £1 and 96,000 ordinary shares of 10s.

AERO ENGINES, LTD., Hanham Road, Kingswood, Bristol. The nominal capital has been increased by the addition of £274,900 beyond the registered capital of £100. The additional capital is divided into 699,600 ordinary shares of 5s. and 1,000,000 deferred shares of 2s.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in parentheses are those under which the specification will be printed and abridged, etc.)

(*Published June* 27, 1935).

33919. HAWKER AIRCRAFT, LTD., and CAMM, S.: Windscreens, particularly for aircraft (429,282).
10018. DUNCANSON, F.: Wing structures for aircraft (429,311).
11825. FAIREY AVIATION CO., LTD., WILLIAMS, D. L. H., LYON, G., and MOOREY, P.: Radiators or condensers for evaporative cooling systems of aircraft engines (429,542).

(*Published July* 4, 1935.)

24400. BENDIX AVIATION CORPORATION. Humidity-responsive devices. (429,827.)
23129. COLVIN, C. H. Navigating and calculating apparatus for aircraft. (429,717.)
24886. SOC. D'INVENTIONS AERONAUTIQUES ET MECANIQUES S.I.A.M. Landing-gear for aeroplanes. (429,867.)

(*Published July* 11, 1935).

34272. SMITH, F. H.: Production of the fuselages or wings of aircraft (429,932).
34787. BOULTON AND PAUL, LTD., and NORTH, J. D.: Aeroplanes (429,948).
28033. BOULTON AND PAUL, LTD., and NORTH, J. D.: Aeroplanes (430,068).
33023. BOULTON AND PAUL, LTD., and NORTH, J. D.: Aeroplanes (430,071).
33599. GABA, A. E.: Variable-pitch airscrews (430,297).
9417. BARKER, G. G. (BENDIX AVIATION CORPORATION): Brakes (430,072).